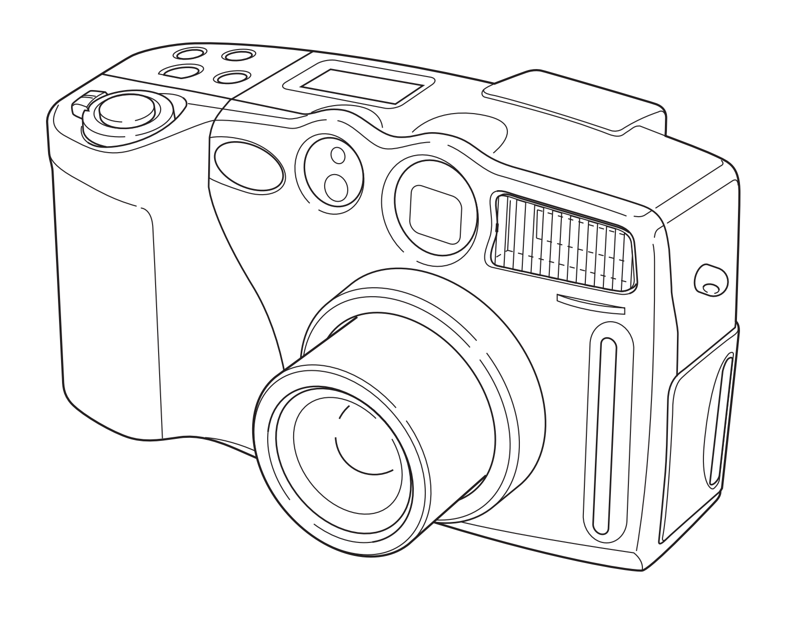
SERVICE MANUAL
& PARTS LIST (without price)

QV-3000EX
(KX-716B)
QV-3000EX/Ir
(KX-716C/D/F)

FEB. 2000



INDEX



Ver. 1 MAR. / 2002

CONTENTS

SPECIFICATIONS

File Format	Still images (including panoramas): JPEG (Exif. Ver. 2.1), DCF standard (Design rule for Camera File system), DPOF compatible, Movies: AVI
Recording Medium	CompactFlash card (Type I/II)
Recorded image Size	2048 x 1536 pixels, 1024 x 768 pixels

Standard Memory Capacity,Number of Image Files,Computer Output Image Size

Still					
Image size (pixels)	Quality	File size	Number of images		
			8 MB memory card	64MB memory card	340MB Microdrive
2048 x 1536	FINE	1.4 MB/images	5 images	43 images	245 images
	NORMAL	1 MB/images	6 images	60 images	342 images
	ECONOMY	600 KB/images	11 images	99 images	562 images
1024 x 768	FINE	350 KB/images	19 images	167 images	943 images
	NORMAL	250 KB/images	27 images	229 images	1292 images
	ECONOMY	150 KB/images	43 images	365 images	2054 images

Movie	
Storage Capacity	Approxmately 300 KB/second
Recording Time	30 seconds per movie (NORMAL) 10 seconds per movie (PAST)

• The maximum length of a single movie is 10 seconds.

Image Deletion	Single image; all images in a folder; all images in memory (with image protection)
Imaging Element	1/1.8-inch CCD (Total Pixels: 3.34 million, Effective Pixels; 3.24 million)
Lens	F2 to 2.5; f = 7 to 21mm (equivalent to 33 to 100mm lens for 35mm film)
Zoom	Optical zoom, 8X; Digital zoom: 32X (in combination with optical zoom) Image size is 1024 x 768 pixels when digital zoom is used.
Focusing	Contrast-detect Auto Focus; manual focus with macro mode and focus lock
Focus Range	Normal focus: 0.3m to ∞ (1´ to ∞) Macro focus: 6cm to 30cm (2.4˝ to 11.8˝) (1X zoom) 9cm to 30cm (3.5˝ to 11.8˝) (2X zoom) The focusing range is the distance from the lens surface to the subject.
Exposure Control	Light Metering: Multi-pattern, center point, spot by CCD Exposure: Program AE, Shutter priority AE, Aperture priority AE Exposure Compensation: –2EV to +2EV (1/3EV units) Exposure Range: Approximately EV7 to EV16
Shutter	CCD electronic shutter; mechanical shutter, 2 to 1/1000 second
Aperture	F2 to F8, auto switching or manual switching
White Balance	Automatic, fixed (4 modes), manual switching
Self-timer	10 seconds, 2 seconds
Built-in Flash	Flash Modes: AUTO, ON, OFF, Red eye reduction Flash Range: Approximately 0.5 to 4 meters (1.6´ to 13.1´)
Recording Functions	One-shot, continuous, movie, panorama, landscape, night scene, portrait, self-timer, macro
Monitor	1.8" TFT, low-glare color HAST LCD (122,100 pixels, 555 x 220)
Viewfinder	LCD Monitor or optical viewfinder
Clock	Built-in quartz digital timepiece for time and date recording and storage with image data; auto calendar up to 2049
Input/Output Terminals	DIGITAL IN/OUT, USB port (special mini port), AC adaptor connector, VIDEO OUT (NTSC, PAL)
Infrared Communication	IrDA; IrTran-P (QV-3000EX/Ir only)

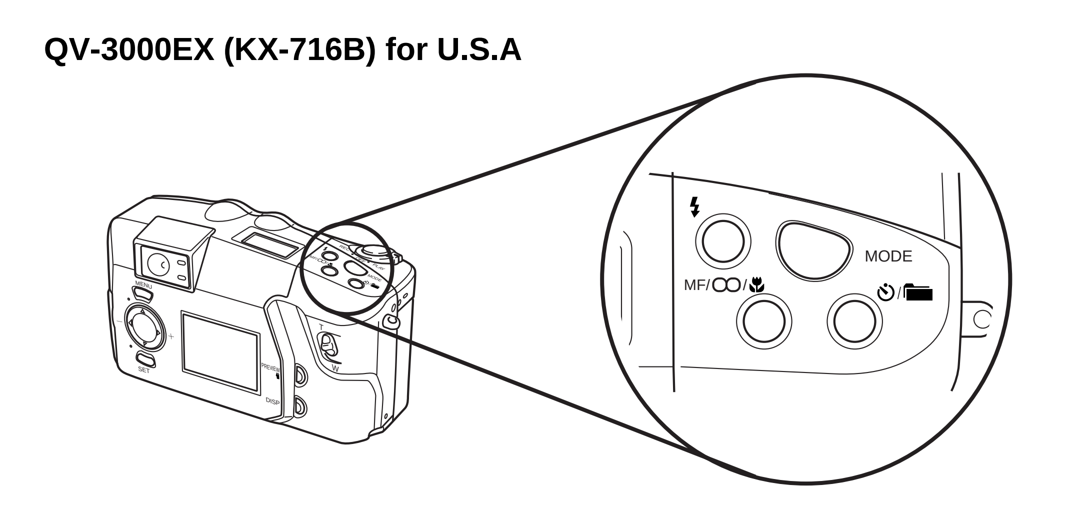
<table>
<tr><td>Power Supply</td><td>Four AA-size alkaline or lithium batteries
Four AA-size nickel-metal hydride rechargeable batteries (NP-H3)
AC adaptor (AD-C620)
AC adaptor charger (BC-3HA)</td></tr>
<tr><td>Battery Life</td><td>The values noted below indicate the number of hours before battery failure under normal operating temperature (25°C). These values are for reference only, and do not guarantee that any particular set of batteries actually will provide the service life indicated. Low temperatures shorten battery life.
<table>
<tr><td>Type of Operation</td><td>AA-size Alkaline Batteries LR6</td><td>AA-size Lithium Batteries FR6</td><td>AA-size Ni-MH Batteries NP-H3</td></tr>
<tr><td>Continuous Playback</td><td>Approximately 145 minutes</td><td>Approximately 270 minutes</td><td>Approximately 170 minutes</td></tr>
<tr><td>Continuous Recording</td><td>Approximately 210 shots</td><td>Approximately 900 shots</td><td>Approximately 660 shots</td></tr>
</table>
• The above figures are approximations only.
• The above guidelines are based on the following battery types:
Alkaline: MX1500 (AA) DURACELL ULTRA
Lithium: Energizer
• Battery life varies with brand.
Continuous recording values show the number of shots without using the flash. The number of shots depends on use of the flash and whether flash is turned on or off.</td></tr>
<tr><td>Power Consumption</td><td>Approximately 6.6W</td></tr>
<tr><td>Dimensions</td><td>134.5(W) x 80.5(H) x 57.5(D) mm (5.3″(W) x 3.2″(H) x 2.3″(D))</td></tr>
<tr><td>Weight</td><td>Approximately 320g (11.2 oz) (excluding batteries)</td></tr>
<tr><td>Standard Accessories</td><td>Neck strap; lens cap; cap holder; soft case; USB cable; video cable; User’s Manual</td></tr>
</table>

- This camera does not have a separate battery to power its clock. Clock settings are cleared whenever power to the camera is cut off (by batteries going dead while the camera is not connected to an AC power outlet with the AC adaptor) for about 24 hours. After power is resumed, either by loading fresh batteries or connecting to an AC power outlet, you will have to set the correct time and date again.
- The liquid crystal panel built into this camera is the product of precision engineering, with a pixel yield of 99.99%. This also means, however that 0.01% of the pixels can be expected to fail to light or to remain lit at all times.

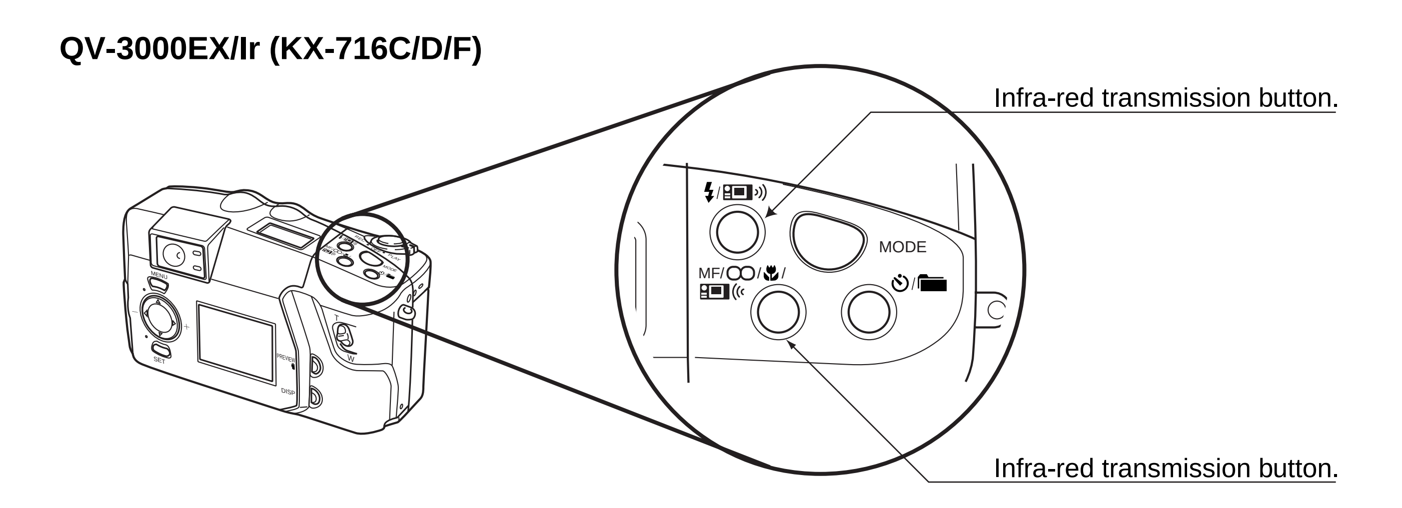
To distinguish the model

Discriminate between infra-red model and non-infra-red model by the following points.

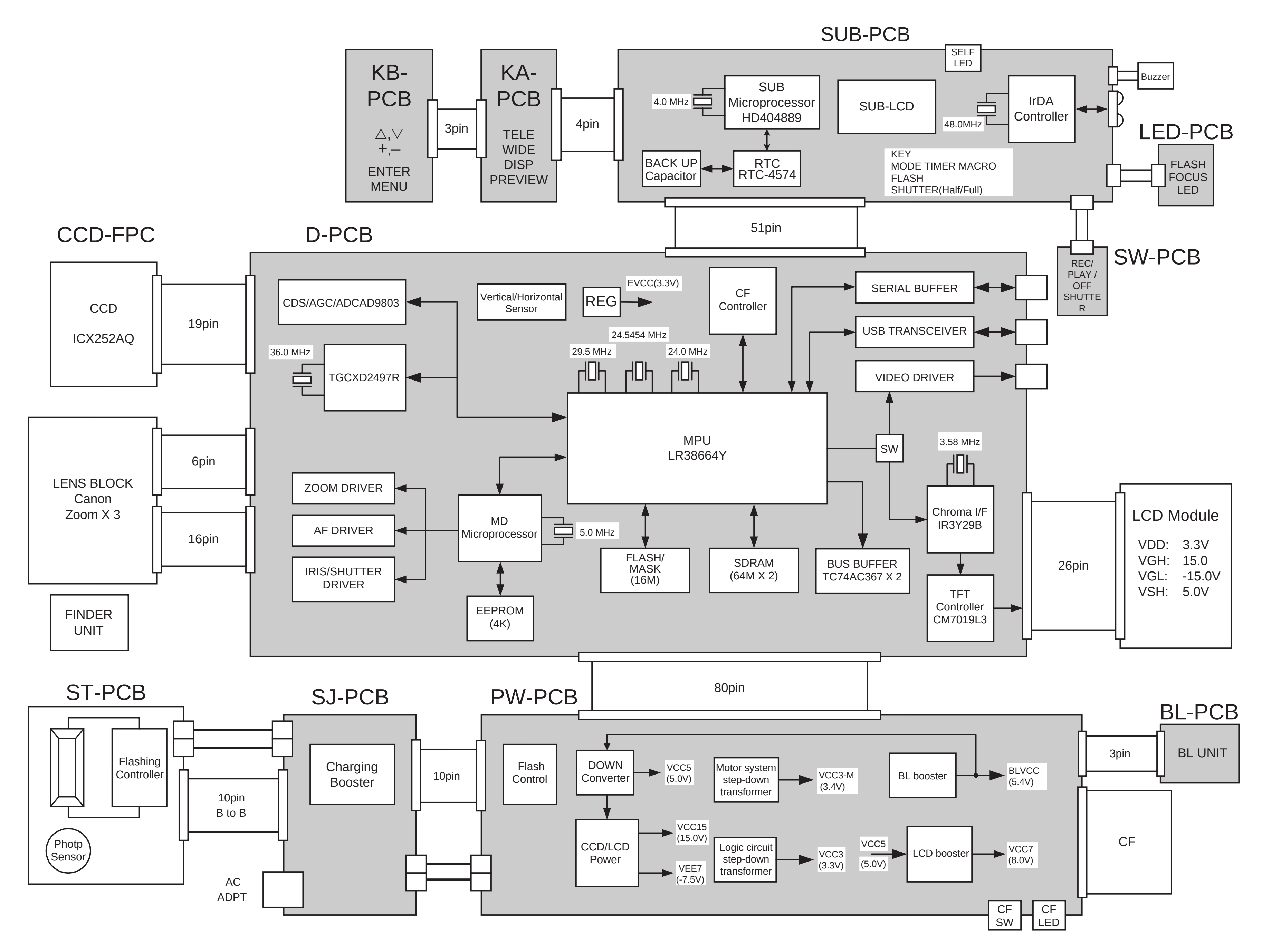
QV-3000EX (KX-716B) for U.S.A



QV-3000EX/Ir (KX-716C/D/F)



BLOCK DIAGRAM



CIRCUIT BLOCK

PCB	Circuit Block	Outline	Main Devices	Note
PW	LCD Power Supply	7.5V Up Converter	XC6367B101MR	Newly employed part
	BL Power Supply	5.4V Up Converter	XC6367A542MR	Newly employed part
	Main Power Supply	3.3V Non adjustable step down transformer	XC6365A333MR	Newly employed part
	CCD 5V Power Supply LCD Power Supply Flash Control Power Video Driver Power Supply	5.0V Voltage regulator	XC62ER5002MR	Newly employed part
	CCD & LCD Power Supply	Power specifications (+15V, -7.5V)	MAX685EEE	Used on QV-8000SX
	Lens Unit AP Power Lens Unit Zoom Power Lens Unit AE Power	3.3V Non adjustable step down transformer	XC6365B103MR	Newly employed part
	Charging Booster Circuit	300V Booster Current control circuit Charging control circuit		Used on QV-8000SX
	Charging Comparator	Light emission control circuit		Used on QV-8000SX
	CF Connector	Complying to TYPE-II (Reverse insertion)		Used on QV-2000UX
D	MPU	Processor Interface Serial Interface CCD Interface NTSC/PAL Encoder JPEG DMA Controller BUS Interface	LR38664Y	Newly employed part CSP package
	Flash Memory (Mask ROM)	16 Mbit (1 M X 16 bit) Flash Memory	LH28F160S3B	Compatible with the Mask ROM CSP package
	SDRAM	64 Mbit (1 Mword X 16 bit X 4 bank) X 2	K4S641632C-TL1 and others	
	CF Controller	CF controller and I/O interface	uPD65839GC	Used on QV-2000UX
	TFT-LCM	1.8" high definition TFT (HAST)	C0D18T1035FN	Newly employed part
	LCD Controller	Complying to high definition TFT (HAST) 3.0V driver	CM7019L3-T4N	Newly employed part
	Chroma Interface	+5V/+7.5V source, C-VIDEO input Brightness fixed	IR3Y29BM	Used on QV-770
	Stand-by power	3.3V three-terminal regulator	XC62FP3302MR	Newly employed part
	8-bit MPU	Driving motor control Flash ROM built in -> Mask ROM after MP	D780034AGK-A03-8A8	
	EEPROM	4Kbit (256word x 16bit)	BR93LC66FV-E2	Used on QV-2000UX
	AF//ZOOM Motor driver	AF ZOOM is 1-2-phase excitation AE is 2-phase excitation	LB1846M	Newly employed part
	Shutter/ AE driver		LB1837M-TE-L	Newly employed part
	USB tranceiver		PDIUSB11AP	Used on QV-8000SX
	Video 75 ohm dirver		TK15405MTL	Used on QV-8000SX
	Serial transport driver			Used on QV-7000SX
	TG/V/H driver	for 3340 thousand picture element CCD (35.0MHz clock)	CXD2497R	Newly employed part
	CDS/AGC/ADC	CDS 11bit Programmable Gain Amplifier 10-bit A/D converter	AD9803JSTRL	Used on QV-8000SX
	Vertical/Horizontal sensor	4-way tilt sensor	Alps electronics	Used on QV-2000UX
SUB	IrDA Controller	IrDA Controller and Serial Controller	PC87109VBE	Used on QV-7000SX
	IrDA Module	Small-type IrDA moule (IrDA1.1)	HSDL-3600	Used on QV-2000UX
	4bit Microprocessor (Mask ROM)	Power ON sequence Key scanning Beep control I/O and others	HD404889	
	RTC	Built-in 32KHz clock real time clock	RTC-4574JE	Used on QV-2000UX
	Backup Capacitor	Watch backup (24H)	EECS0HD104H	Used on QV-2000UX
	SUB-LCD			Used on QV-2000UX
BL	Inverter Circuit	BL unit		Used on QV-2000UX
SW	PW ON/OFF			Newly employed part
	BB-PCB KEY SW	Board-toBoard connection PCB KA-PCB, KB-PCB		Used on QV-2000UX
CCD	CCD	1/1.8 inch, 3,340,000 picture element	ICX252AQ	Newly employed part

ADJUSTMENT

■ Preparation

1. PC (IBM Compatible)/OS:Windows 95/98
2. Link cable.
3. Adjustment program
   1) ADJ716.EXE (Color adjustment data transfer program)
   2) FLOAD.EXE (Camera unit version up program)
   3) _ROM.BIN (Camera unit program data)
   4) _GMENU.BIN (Camera unit menu display data)
4. AC adaptor or stabilizer
5. Digital oscilloscope
6. Multimeter
7. Ammeter
8. Frequency counter
9. TV (with video terminal)
10. Video cable
11. Battery (battery operation/battery cover lock)
12. PC link program : Photo Loader (Communication function confirmation)
13. USB cable/USB driver (USB function confirmation)
14. Test chart (for photography check)
    That which carried out color printing of picture data "CHART1.JPG" and the "CHART2.JPG".

CHART1.JPG

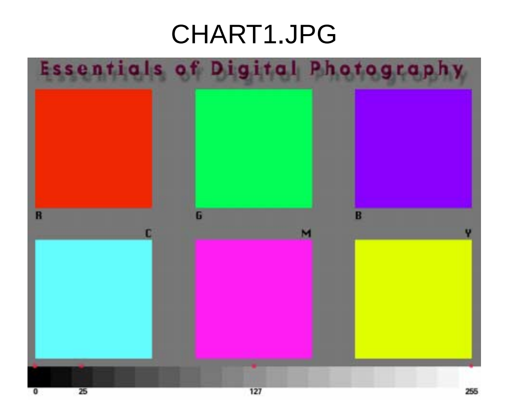
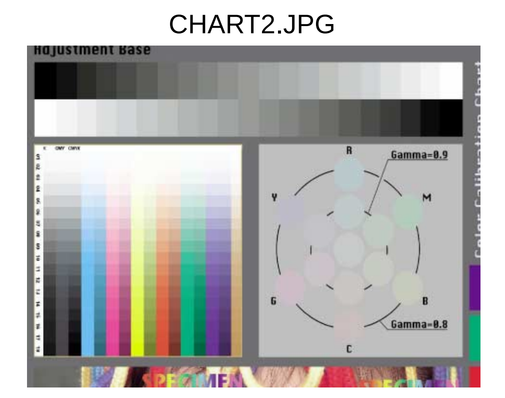


CHART2.JPG



1. Program version upgrading

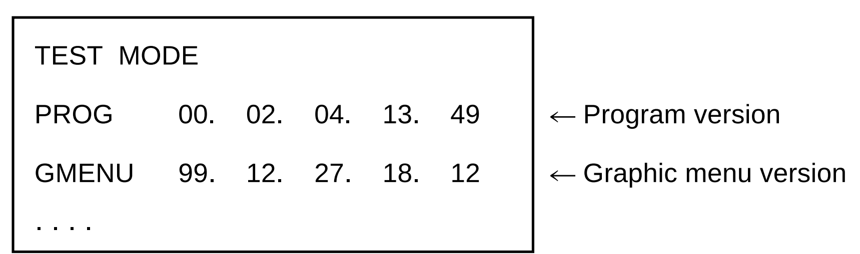
In the camera unit, program and graphic menu are stored.
Please check the version and update it if the version is not updated.
There are two method of program updating; using CompactFlash card or utilizing PC link cable.

Note:
1. Be sure to use AC adaptor.
   PCB D becomes unusable if power down or an error occurs during program transmission.
2. Unit using a mask cannot update the program.

1-1. How to confirm the program (graphic menu) version

1. Boot the test mode.
   Turn the power on while pressing DISP and MENU buttons simultaneously.
2. Check the LCD display.

(Example)

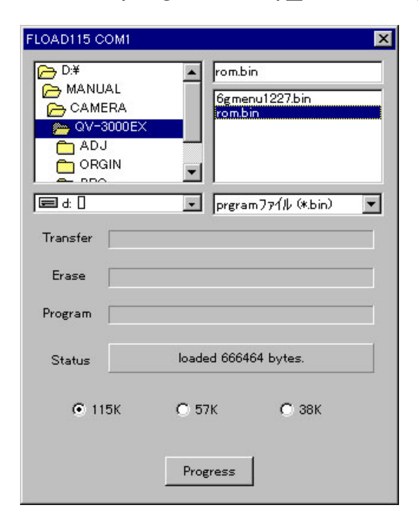


1-2. Upgrading procedure using the CompactFlash card

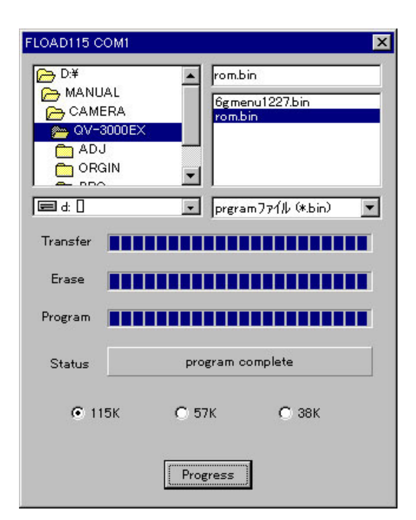
(1) Copy the latest program (_ROM.BIN) and graphic menu (_GMENU.BIN) on a CompactFlash card then set the CompactFlash card on the camera.
(2) Connect an AC adaptor on the camera.
(3) Boot the test mode.
    Turn the power on while pressing DISP and MENU keys simultaneously.
(4) Camera's display shows the followings.
    It is normal if two OK's are shown after about 1 minute.
    After then, the camera is set on the Camera mode automatically.
    SIZE OK 666464
    SIZE OK 1305532
(5) Turn the camera off.
(6) Chgange the CompactFlash card with the one for picture taking.
(7) Boot the test mode and confirm the program version.
    Turn the power on while pressing DISP and MENU buttons.
(8) Finally, check the camera's function (shooting and playback).

1-3. Upgrading procedure using the PC link cable

(1) Turn the camera off and extract CompactFlash card.
(2) Connect PC link cable.
(3) Boot the transmission program (FLOAD.EXE).
(4) Choose program file (_ROM.BIN) or graphic menu file (_GMENU.BIN).



(5) Select data transmission speed (115K/57K/38K).
(If errors occur, lower the transmission speed.)
(6) Click Progress button.
(7) Connect an AC adaptor on the camera and turn the camera on.
(8) Data transmission starts.



(9) Data transmission is completed normally when Status box shows "program complete."
(10) Disconnect AC adaptor plug (cannot be turned off by the power switch).
(11) Change the CompactFlash card with one for shooting.
(12) Boot the test mode and confirm the version.
Turn the camera on while pressing DISP and MENU buttons.
(13) Shoot a picture and confirm the camera function (shooting and playback.)

2. Test mode

Note: Do not perform the menu item unless explained here. (It may damage the internal data and camera becomes unusable.)

2-1. Booting

To boot the test mode;
Turn the camera on while pressing DISP and MENU buttons.

To boot MENU1
Press PREVEIW ➜ PREVEIW ➜ MENU keys in order rapidly.

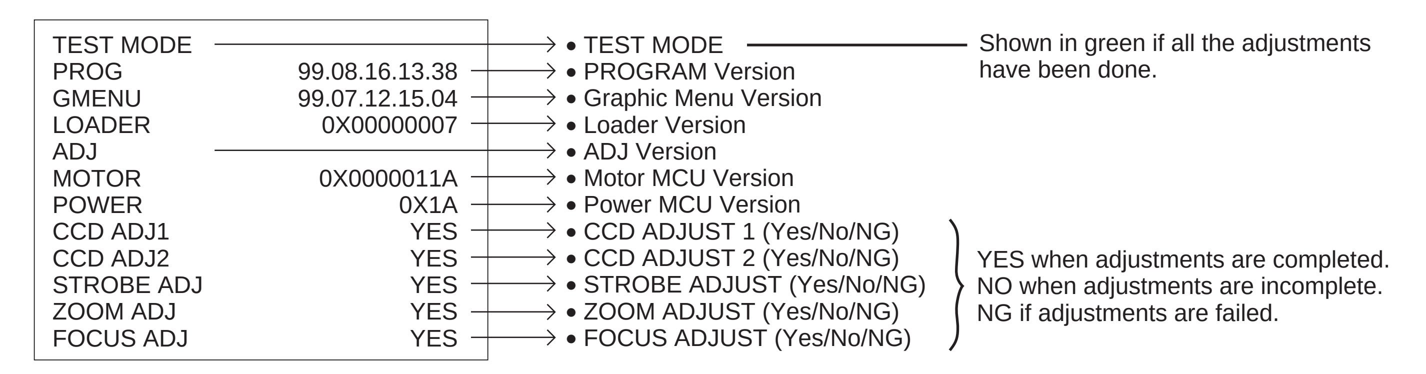
To boot MENU2
Press FLASH ➜ FLASH ➜ MENU keys in order rapidly.

* To execute
Use + or – keys to select a test item then press shutter button to execute it.

To boot MENU3
Press SELF ➜ SELF ➜ MENU keys in order rapidly.

2-2. Item for testing

① TEST MODE



② MENU1

MENU1
1. INIT.NTSC JAPANESE
2. LED+SUBLCD
3. INIT.NTSC ENGLISH
4. CROSS HATCH
5. ANG DET CHECK
6. INIT.PAL ENGLISH
7. COLOR BAR
8. 50PERCENT GRAY

③ MENU2

MENU2
1. CCD ADJ ALL
2. ZOOM ADJUST
3. CCD1 (AWB AGC)
4. CCD2 (APATURE)
5. CCD3 (SHUTTER)
6. KIZU
7. IRDA MASTER
8. FOCUS ADJUST
9. STOROBE ADJUST

④ MENU3

MENU3	1/3
1. DISPLAY LENS ADJ	
2. REC INFO	
3. BATT. TEST	
4. PROG+GMENU UPDATE	
5. PROG UPDATE	
6. GMENU UPDATE	
7. CHECK SUM	
8. OSD DATA CHECK	
9. ERROR MESSAGE CHECK	
10. SDRAM CHECK	

MENU3	2/3
11. KEY CHECK	
12. LED CHECK	
13. CF CHECK	
14. SUB LCD CHECK	
15. CF WRITE TEST	
16. AF DATA SAVE	
17. EEPROM TEST	
18. ADJ CLEAR	
19. NOISE CAPTURE	
20. BAYER CAPTURE	

MENU3	3/3
21. SHUTTER CLOSE REC	
22. SHUTTER SPEED CONST	
23. GRAY SCALE (10STEP)	
24. WHITE	
25. BLACK	
26. IRDA SLAVE	
27. IRDA FACTORY SLAVE	

3. Product conditions

Note: Help command on adjustment window cannot be used as it uses Japanese system.



3-1. Color adjustment data writing

1. Summary

(1) QV-3000EX is a high quality digital camera and makeshift adjustments cannot cover the quality of the camera's picture.
Therefore, we have prepared set of lens ass'y that is adjusted precisely in the factory and a floppy disc containing the lens'es adjustment data as spare parts.

(2) These adjustment data are stored in the EEPROM on PCB D.

2. Repairs

It is necessary to write color adjustment data for the replacements of the following units.

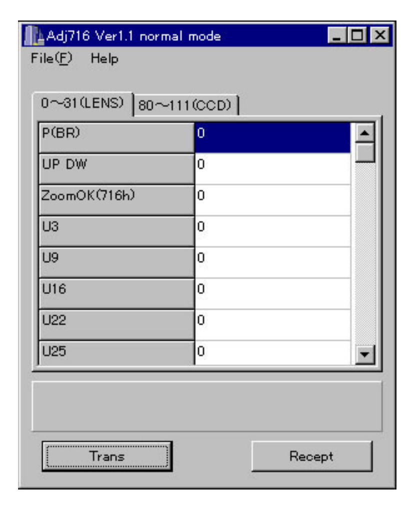
(1) Lens ass'y
(2) PCB D (when EEPROM contents can be read)
(3) PDB D and lens ass'y (when EEPROM contents cannot be read)

3. To replace the lens ass'y

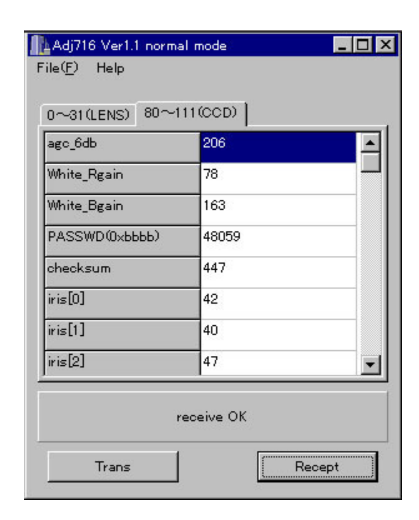
(1) Connect AC adaptor and PC link cable to the camera.
Note: Connect the link cable to serial port COM1.

(2) Turn the camera on to set it on PLAY mode.

(3) Boot adjustment program ADJ716.EXE.
At this time, each adjustment data are 0.

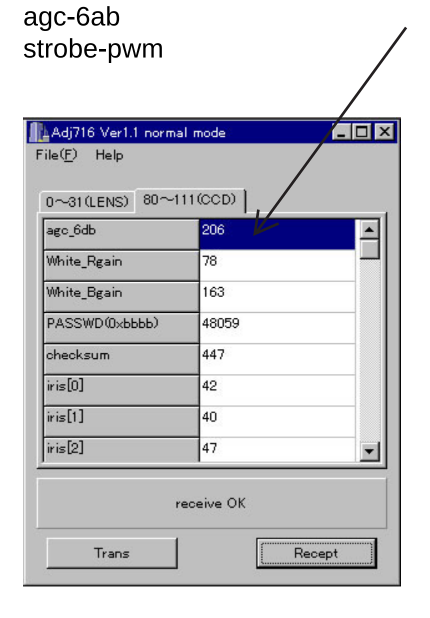


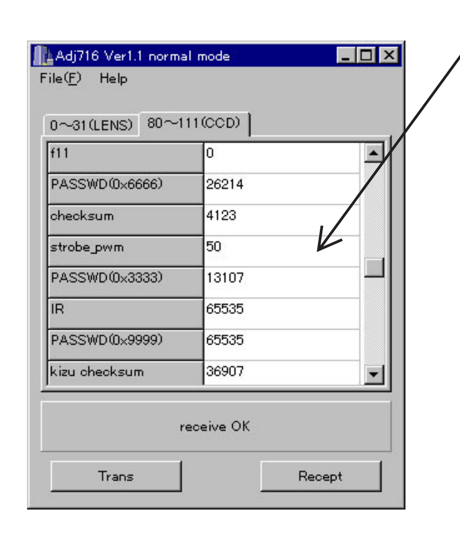
(4) Read the adjustment data of before repairs.
Click the Receipt button. “receive OK” will be indicated and adjustment data are shown.



Reference: At this time you can save the adjustment data in your PC.
File (F) ➜ Save as (A)
Select the drive and name the file then save it.
(Note: Do not forget to put extension code ".ADJ".)

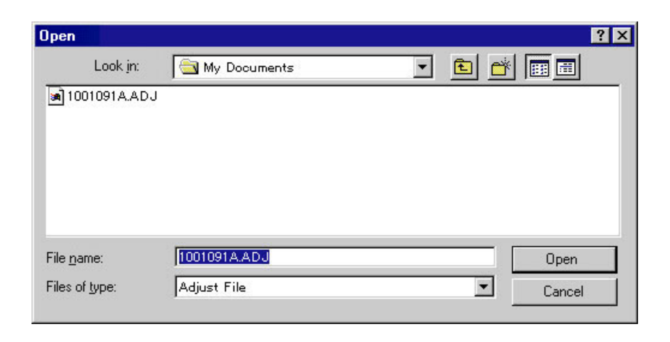
(5) Write down the following numbers.
agc-6ab
strobe-pwm





(6) Replace the lens ass'y.
(Adjusted in the factory and comes with adjustment data)
(7) Connect AC adaptor and PC link cable to the camera.
(8) Turn the camera on and set it on PLAY mode.
(9) Boot the adjustment program (ADJ716.EXE).

(10) Insert the floppy disc containing adjustment data of the lens ass'y in your PC and read the data.
File (F) ➜ Open (O)
Select FDD
Select adjustment data file with extension code .ADJ.



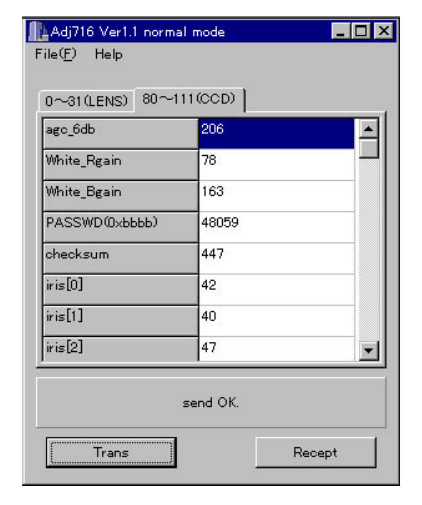
* Adjustment data file name: 9999999.ADJ
* 9999999 is the 7-digit number written on the seal stuck on the side of the lens unit.

(11) Change the following data with the number you have written on step 5 (data before replacing the lens unit).
Caution: Never change the other data.
Agc-6db
Strobe-pwm

(12) Add the sum of three numerals agc-6db:206, white-Rgain, and white-Bgain on the checksum.
(Example) agc_6db : 206
+
white_Rgain : 78
+
white_Bgain : 163
||
checksum : 447

Note: If erroneous nuber is input, color adjustment cannot be done.

(13) Transfer the data to the camera.
Click Trans button on ADJ window.
"send OK" will be shown.



(14) Turn the camera off.

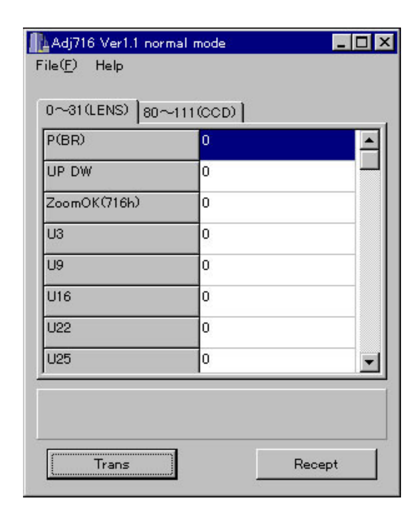
(15) Booting the test mode, be sure that each adjustment item is YES.
Power on while pressing DISP and MENU keys simultaneously.

CCD1	YES	STROBE	YES
CCD2	YES	KIZU	YES
CCD3	YES	ZOOM	YES
		FOCUS	YES

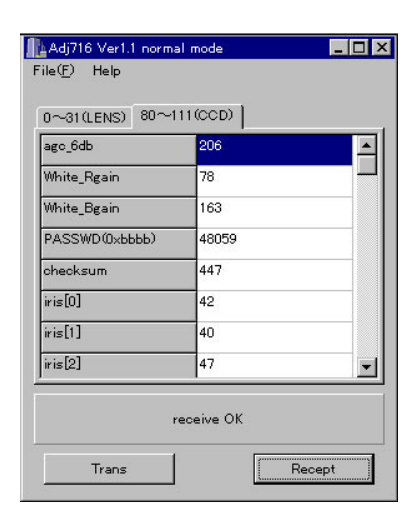
(16) Check the camera operation by shooting a picture and play it back.

4. To replace PCB D (in case the contents of EEPROM can be read)

(1) Connect AC adaptor and PC link cable to the camera.
Note: Connect the link cable to serial port COM1.
(2) Turn the camera on to set it on PLAY mode.
(3) Boot adjustment program ADJ716.EXE.
At this time, each adjustment data are 0.

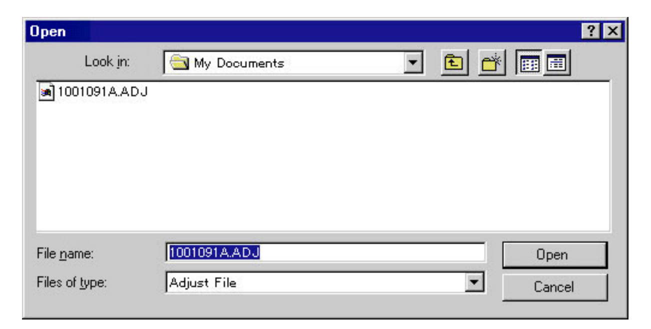


(4) Read the adjustment data of before repairs.
Click the Receipt button. "receive OK" will be indicated and adjustment data are shown.

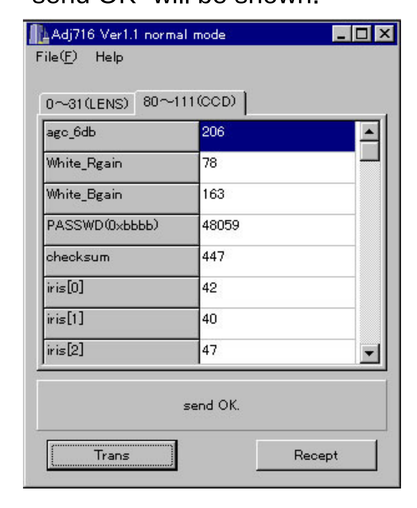


(5) Save the adjustment data in the PC.
File (F) ➜ Save as (A)
Select a drive to save data.
Name a file name then save the data.
(It is better to name the camera's serial number as the file name.)
XXXXXXXX.ADJ (Note: do not forget the extension code .ADJ.)
(6) Replace the PCB D
(7) Connect AC adaptor and PC link cable to the camera.
(8) Turn the camera on and set it on PLAY mode.
(9) Boot the adjustment program (ADJ716.EXE).

(10) Load the saved data of the lens unit.

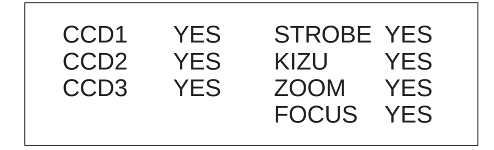


(11) Transfer the data to the camera.
Click Trans button on ADJ window.
“send OK” will be shown.



(12) Turn the camera off.

(13) Booting the test mode, be sure that each adjustment item is YES.
Power on while pressing DISP and MENU keys simultaneously.

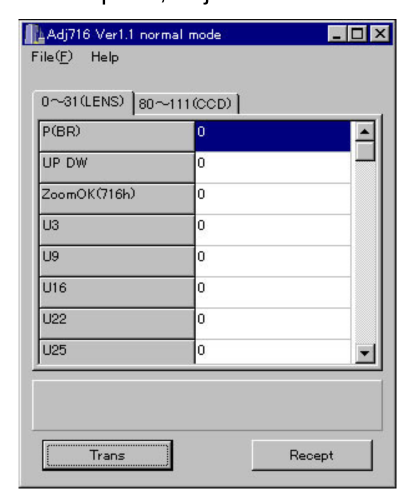


CCD1	YES	STROBE	YES
CCD2	YES	KIZU	YES
CCD3	YES	ZOOM	YES
		FOCUS	YES

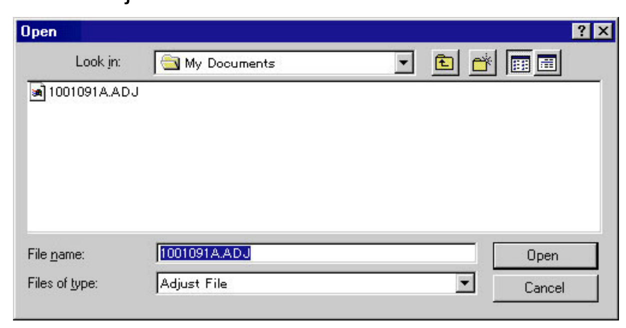
(14) Check the camera operation by shooting a picture and play it back.

5. In case of replacing PCB D and lens ass'y (EEPROM on PCB D contents cannot be read)

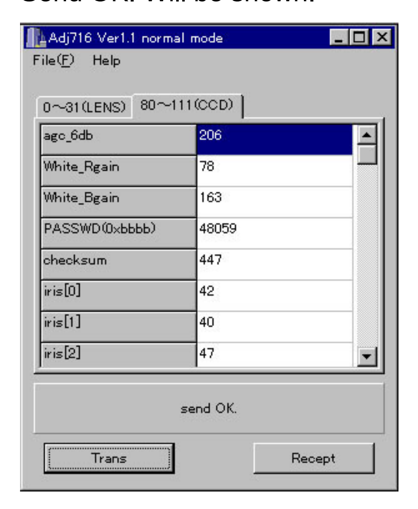
(1) Replace PCB D and lens ass'y.
(2) Connect AC adaptor and PC link cable to the camera.
Note: Connect the link cable to serial port COM1.
(3) Turn the camera on to set it on PLAY mode.
(4) Boot adjustment program ADJ716.EXE.
At this point, adjustment data of each item is zero.



(5) Insert the floppy disc containing adjustment data of the lens ass'y in your PC and read the data.
File (F) ➜ Open (O)
Select FDD
Select adjustment data file with extension code .ADJ.and load it.



(6) Transfer the adjustment data to the camera.
Clock Trans button on ADJ program window.
Send OK. Will be shown.



(7) Turn the camera off.
(8) Booting the test mode, be sure that each adjustment item is YES.
Power on while pressing DISP and MENU keys simultaneously.

CCD1	YES	STROBE	YES
CCD2	YES	KIZU	YES
CCD3	YES	ZOOM	YES
		FOCUS	YES

(9) Perform the function check (Record/Playback).
(10) Perform the flash adjustment.

3-2. Flash adjustment

1. General

Do not fail to perform this adjustment when you replace the flash unit.

2. Necessary equipment

(1) Dark room
(2) AC adaptor
(3) Gray paper (Superior's oxford gray No. 22)
The following sizes are available from us (also available from camra shop).

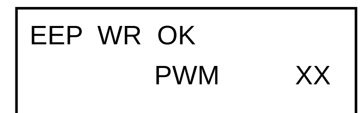
Parts code	Parts name	Specifications
1904 5411	Superior photographing background paper	No. 22 (1.75 x 2.7m)
1904 5412	Sperior photographing background paper	No. 22 (2.72 x 11m)

3. Condition

(1) Perform in a dark room.
(1) Distance between flash lens and gray paper should be 1 meter.
(1) Use lighter color of the gray paper.
Paper should be larger enough to fit in a picture taken from 1 meter distance.
(Reference; more than 1.5m x 2.0m)

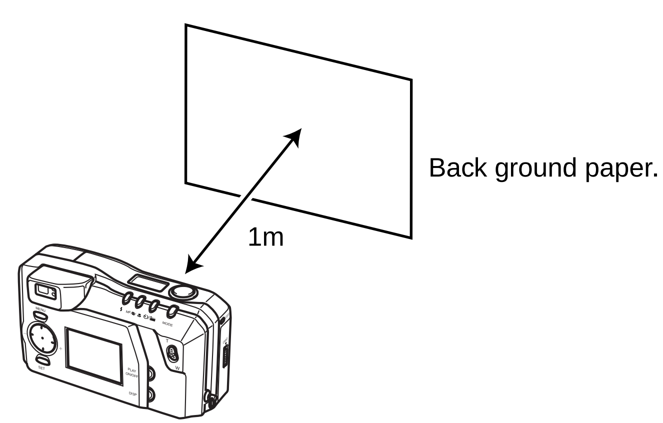
4. Adjustment

(1) Connect an AC adaptor to the camera.
(2) Set the camera in REC mode.
(3) Boot the MENU2 in the test mode.
Turn the camera on while pressing DISP and MENU keys sumultaneously.
Press FLASH ➜ FLASH ➜ MENU in order quickly.
(4) Using + and – keys, choose STROB ADJUST and press the shutter button.
(5) When STROBE indicator appears on the right upper corner, turn the light off then press the shutter with the above conditions.
(6) The camera flashes more than 4 times.
(7) Confirm the following indication and turn the camera off.



(8) Boot the test mode.
Turn the camera on while pressing DISP and MENU keys.
(9) Make sure that STROB ADJ column is YES.
(10) Turn the camera off.

5. Block diagram



3-3. Flash operation and recharge operation

- Set QV-2000UX in “REC” mode.
- Normal Recording mode.
- Apply 6.0 ± 0.1 V voltage on DC in jack.

1. Preparation

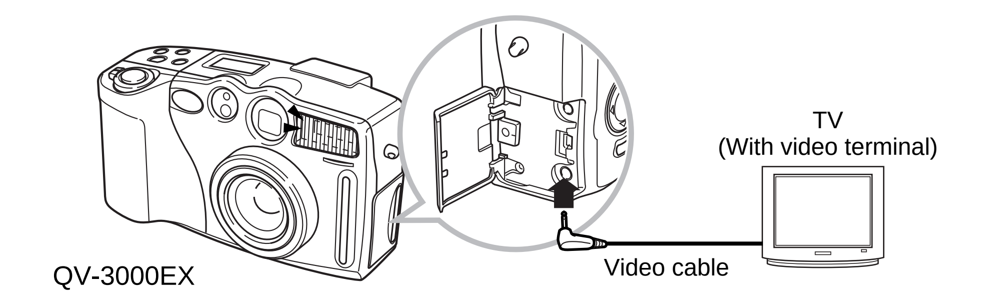
(1) AC adaptor or stabilizer.
(2) Ammeter.
(3) TV (With video terminal).
(4) Video cable.

2. Adjustment and checking

(1) Shoot a picture with flash OFF. (Make sure there is no flash)
(2) Shoot a picture with flash ON and make sure it flashes once.
(3) Shoot in red eye reduction mode and make sure it flashes twice.
(4) Connect QV-3000EX and TV with video cable and make sure that the pictures taken in steps (2) and (3) are not whitish, dark or erroneously colored.
(5) Make sure that the charging current is less than 1.3 A.

3. Notes

(1) Excuete in a dark room.
(2) Shoot a colorful object as much as possible.



3-4. Current consumption

• Set QV-3000EX to "PLAY" mode.

1. Preparation

(1) Voltage regulator.
(2) Ammeter.

2. Adjustment procedure

(1) Current consumption (DC in = 6.0 ± 0.1 [V])
- Make sure that current consumption is less than 550 mA in PLAY mode.
- Make sure that current consumption is less than 800 mA in REC mode.
  (Flash charge current is not included)

(2) Lower the voltage from 6 V as shown below then make sure the battery warning indicator changes.

DC in = 5.0 ± 0.05 [V] (one indicator is off)

DC in = 4.65 ± 0.05 [V] (two indicators are off)

DC in = 4.35 ± 0.05 [V] (All the indicators are off)

3-5. VCOM DC adjustment

1. Preparation

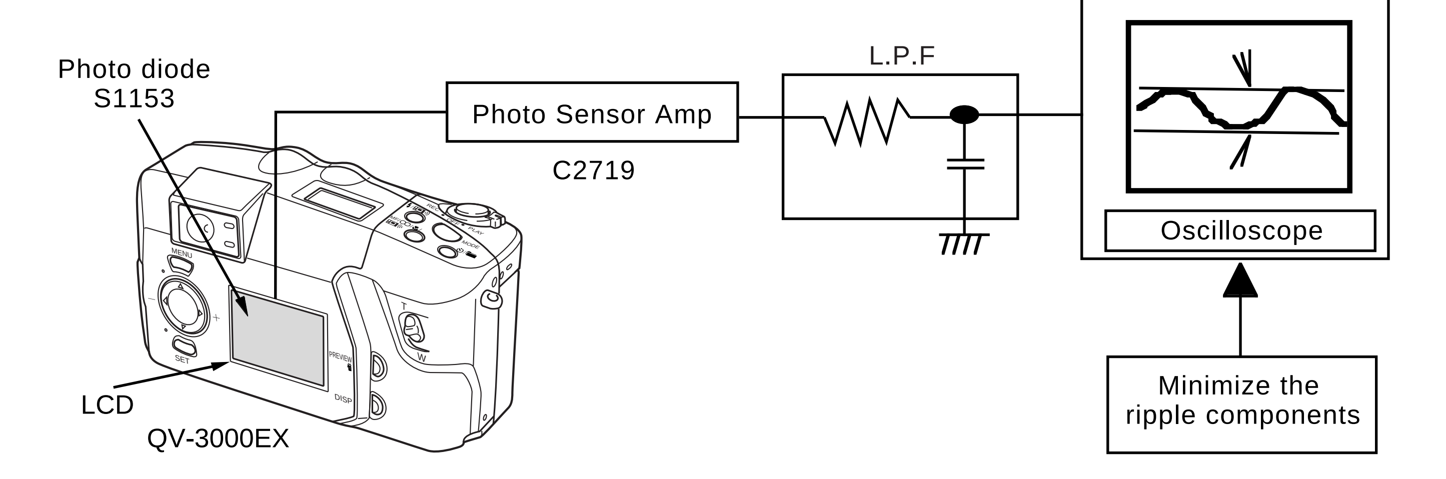
(1) AC adaptor or stabilizer.
(2) Photo sensor/ Photo sensor amp (C2719)/L.P.F
(3) Digital oscilloscope.

2. Adjustment and checking

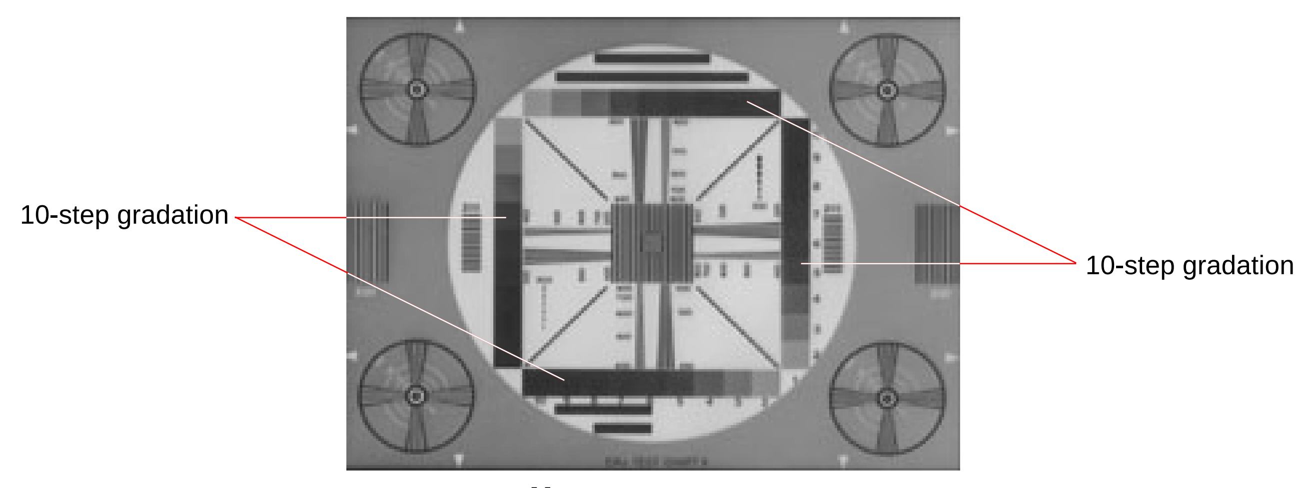
(1) Turn the power on while pressing DISP and MENU keys simultaneously. (TEST MODE)
(2) Push PREVIEW ➜ PREVIEW ➜ MENU keys in order rapidly. (TEST MODE 1)
(3) Choose 50 PERCENT GRAY and execute it.
(4) Monitor the photo sensor amplifier output via a low-pass filter of cutoff frequency 60Hz. Monitoring the oscilloscope screen, adjust VR321 to minimize 60Hz ripple waveform.

3. Notes

Perform these adjustments when you replace LCD module or PCB L.



(Reference) Easy adjustment
(1) Shot a monoscope pattern with the camera and adjust VR321 so that the best 10-step gradation is taken.



Monoscope pattern

3-6. Operation check

1. Preparation

(1) Batteries.
(2) AC adaptor.
(3) PC (IBM compatible)/OS:Windows 95/98.
(4) Link cable.
(5) Photo loader (program).
(6) TV (with video teminal).
(7) Video cable.
(8) USB cable/USB driver
(9) Test chart (for photography check)
(That which carried out color printing of picture data "CHART1.JPG" and the "CHART2.JPG".)

2. Check matter

(1) Photography check (Please be sure to carry out.)

① Shoot the test chart without flashing.
② Shoot the test chart with flashing.
③ Confirm the result (compare with properly functioning camera) for;
- Color
- Focus and resolution

(2) Unti-shock check, Battery operations, AC adaptor operations
(3) Switch operation.
(4) CompactFlash insertion/pulling out movement, cover open/close operations
(5) Optical zoom finder function
(6) Sub LCD display check
(7) Resolution, color reproduction check
(8) AE function, AF function, zoom operation
(9) IrDA transmission check (model C for export only)
(10) Video output, serial (3-pin) data transmission, USB function check
(11) Dust and scratches on lens.
(12) Appearance check

3. Note

(1) Make sure Video out setting are appropriate to your country.
(i.e. Japan=NTSC, England = PAL)

4. Test chart picture

CHART1.JPG

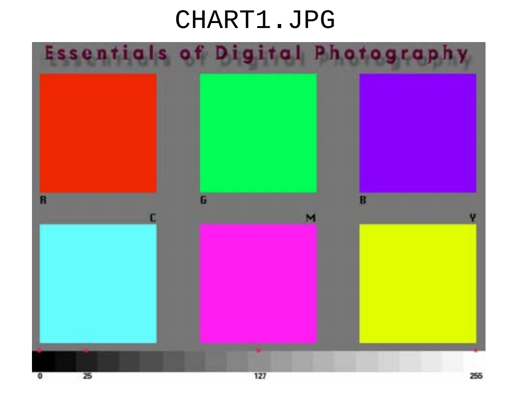
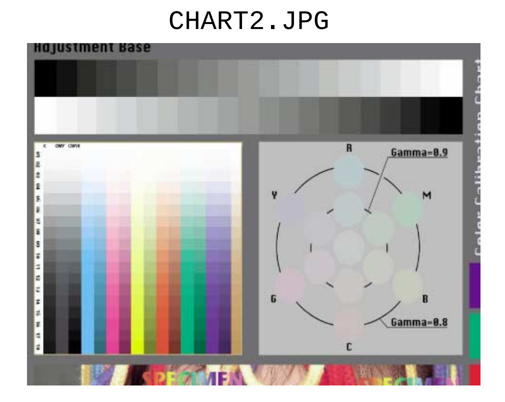


CHART2.JPG



4. D-PCB Assy

4-1. VCO free run frequency adjustment

1. Adjustment procedure

- Make sure
  VCC5 (CP344) = 5.0 ± 0.05 [V]
  VCC15 (CP391) = 15.0 ± 0.45 [V]
  VCC7 (CP390) = 8.0 ± 0.05 [V]
  VCC3 (CP220) = 3.3 ± 0.08 [V]
- Room temperature should be 20 ± 10 °C

2. Preparation

- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment and checking

(1) Connect SYF (CP355) and GND (CP350).
(2) Monitor HDB (CP704) with frequency counter and adjust VR320 so that frequency becomes 15.734 ± 0.1 KHz.
(3) After completing adjustment, disconnect SYF (CP7033) and GND (CP700).

4-2. VCOM AC adjustment and VCOM DC coarse adjustment

1. Adjustment procedure

- Make sure
  VCC5 (CP344) = 5.0 ± 0.05 [V]
  VCC15 (CP391) = 15.0 ± 0.45 [V]
  VCC7 (CP390) = 8.0 ± 0.05 [V]
  VCC3 (CP220) = 3.3 ± 0.08 [V]

2. Preparation

- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment procedure

(1) Make sure amplitude of VCOM output (CP364) is 6.6 ± 0.3 V.
(2) Adjust VR321 so that maximum VCOM output (CP364) will be 4.8 ± 0.2 V.

4. Note

When unable to adjust using AC adaptor, use voltage regulator and supply power to be VCC1-1 (CP105) = 5.0 ± 0.05 V.

4-3. RGB AMP, Sub bright adjustment

1. Adjustment procedure

- Make sure

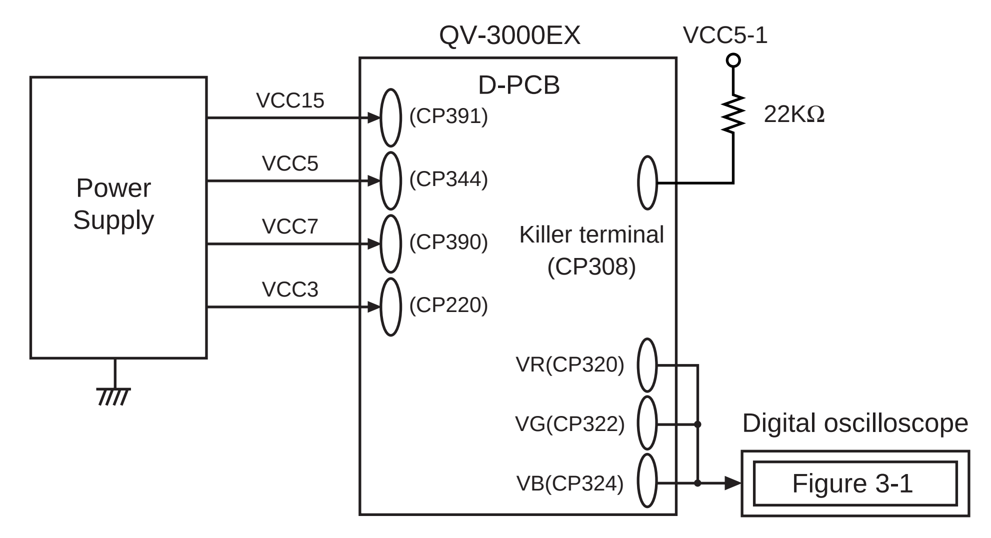
VCC5 (CP344) = 5.0 ± 0.05 [V]
VCC15 (CP391) = 15.0 ± 0.45 [V]
VCC7 (CP390) = 8.0 ± 0.05 [V]
VCC3 (CP220) = 3.3 ± 0.08 [V]

2. Preparation

- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment and checking

(1) Turn the power on while pressing DISP and MENU keys simultaneously. (TEST MODE)
(2) Push PREVEIW ➜ PREVEIW ➜ MENU keys in order rapidly. (TEST MODE 1)
(3) Select GRAY SCALE (10STEP) and execute.
(4) Apply VCC5-1 (CP362) on the killer terminal (CP308) via 22k ohm resistor.
(5) Trigger VB waveform (CP322) by FRP (CP305) signal to adjust as noted below.
(6) Adjust RGB-AMP VR (VR302) so that VG waveform (CP322)'s pedestal-pedestal voltage is 4.30 ± 0.05 Vp-p.
(7) Adjust SUB R BRIGHT VR (VR305) so that VR waveform (CP320)'s pedestal-pedestal voltage is 4.30 ± 0.05 Vp-p.
(8) Adjust SUB B BRIGHT VR (VR304) so that VB waveform (CP324)'s pedestal-pedestal voltage is 4.20 ± 0.05 Vp-p.
* Make sure that waveforms are not distorted.
* Proceed to CONTRAST, BRIGHT adjustments.



4.30 ± 0.05 or 4.20 ± 0.05V
(pedestal-pedestal)



3-1

4-4. Contrast, Bright adjustments

1. Adjustment procedure

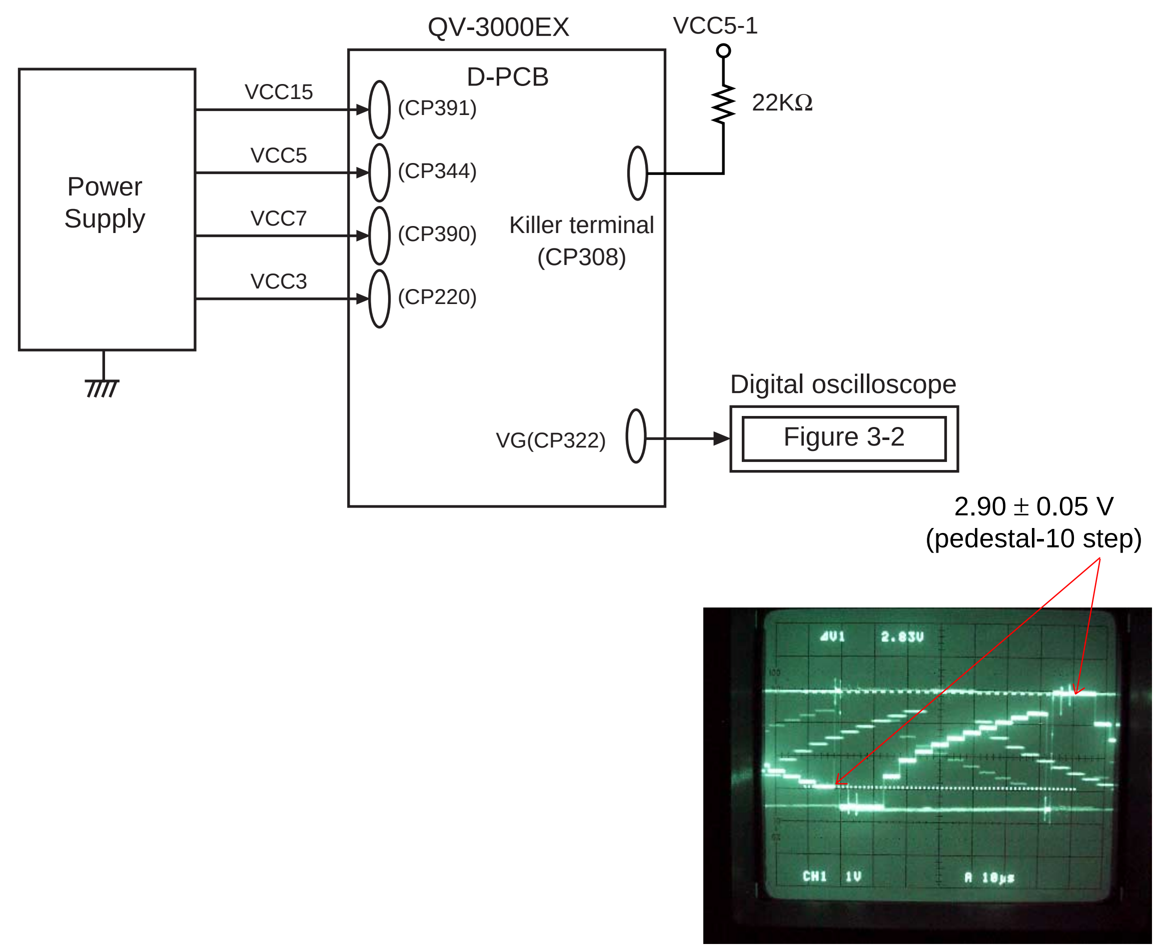
- Make sure
  VCC5 (CP344) = 5.0 ± 0.05 [V]
  VCC15 (CP391) = 15.0 ± 0.45 [V]
  VCC7 (CP390) = 8.0 ± 0.05 [V]
  VCC3 (CP220) = 3.3 ± 0.08 [V]
- RGB AMP and SUB BRIGHT adjustments should be completed (proceed from those adjustments.)

2. Preparation

- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment and checking

(1) Turn the power on while pressing DISP and MENU keys simultaneously. (TEST MODE)
(2) Push PREVEIW ➜ PREVEIW ➜ MENU keys in order rapidly. (TEST MODE 1)
(3) Select GRAY SCALE (10STEP) and execute.
(4) Apply VCC2-1 (CP344) on the killer terminal (CP308) via 22k ohm resistor.
(5) Trigger VB waveform (CP322) by FRP (CP305) signal to adjust as noted below.
(6) Adjust contrast VR (VR306) so that contrast terminal voltage (CP306) is 1.50 ± 0.05 V temporary.
(7) Adjust Bright VR (VR303) so that pedestal-4th step is 2.45 ± 0.05Vp-p.
(8) Adjust Contrast VR (VR306) so that pedestal-10th step (white 100 %) is 2.90 ± 0.05Vp-p.
(9) After the adjustment, remove the 22k ohm resistor between killer terminal (CP308) and VCC5-1 (CP362).
* Make sure that waveforms are not distorted.



3-2

4-5. Color adjustment

1. Adjustment procedure

- Make sure
  VCC5 (CP344) = 5.0 ± 0.05 [V]
  VCC15 (CP391) = 15.0 ± 0.45 [V]
  VCC7 (CP390) = 8.0 ± 0.05 [V]
  VCC3 (CP220) = 3.3 ± 0.08 [V]
- Perform this adjustment after Contrast adjustment.

2. Preparation

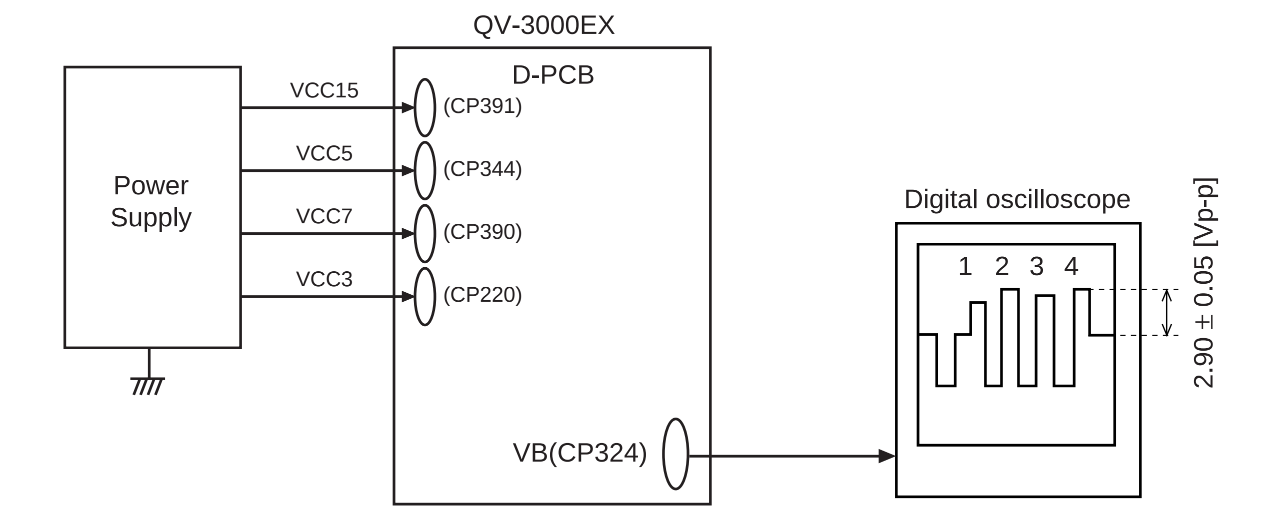
- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment and checking

(1) Turn the power on while pressing DISP and MENU keys simultaneously. (TEST MODE)
(2) Push PREVEIW ➜ PREVEIW ➜ MENU keys in order rapidly. (TEST MODE 1)
(3) Select and execute COLOR BAR.
(4) Trigger with FRP (CP305) signal.
(5) Adjust VR300 so that pulse width of 4th VB waveform (CP324) (pedestal-peak) is 2.90 ± 0.05Vp-p.
(6) Proceed to TINT adjustment.

4. Note

Perform the adjustment after (continuously from) Color adjustment.



4-6. TINT adjustment

1. Adjustment procedure

- Make sure
  VCC5 (CP344) = 5.0 ± 0.05 [V]
  VCC15 (CP391) = 15.0 ± 0.45 [V]
  VCC7 (CP390) = 8.0 ± 0.05 [V]
  VCC3 (CP220) = 3.3 ± 0.08 [V]
- Perform this adjustment after Contrast adjustment.

2. Preparation

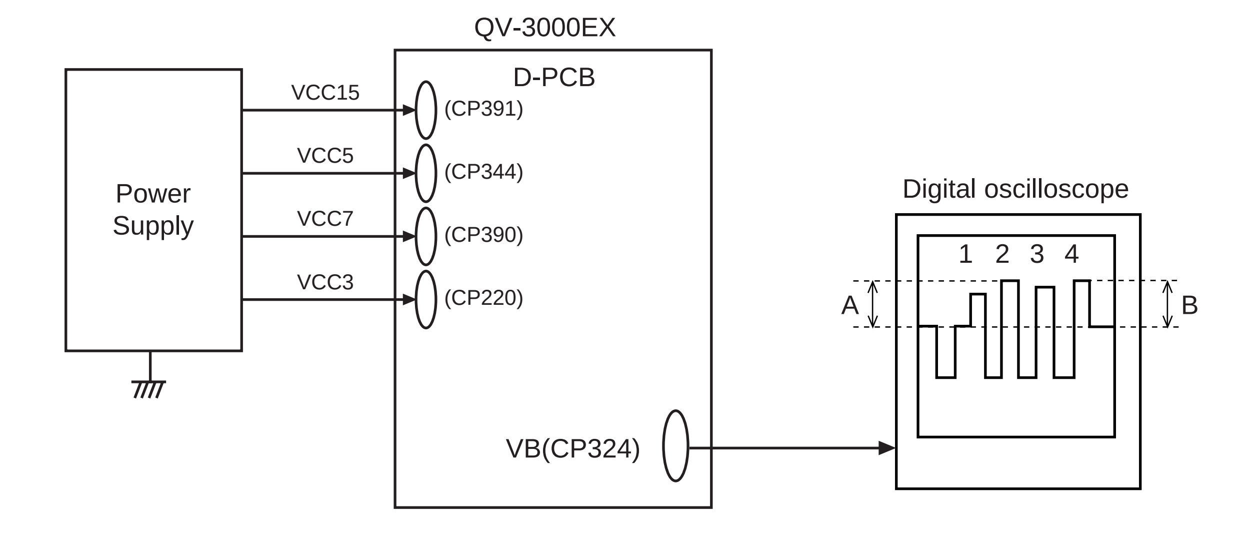
- AC adaptor or voltage regulator
- Frequency counter

3. Adjustment and checking

(1) Turn the power on while pressing DISP and MENU keys simultaneously. (TEST MODE)
(2) Push PREVEIW ➜ PREVEIW ➜ MENU keys in order rapidly. (TEST MODE 1)
(3) Select and execute COLOR BAR.
(4) Trigger with FRP (CP305) signal.
(5) Adjust VR301 so that potential difference between the 2nd and 4th pulses' height (pedestal-peak) (A and B) of VB waveform (CP324) is less than 0.1Vp-p.

4. Note

Perform the adjustment after (continuously from) Color adjustment.



5. PW-PCB Assy

5-1. VCC3, VCC3-M, VCC5, VCC7 Voltage check

1. Preparation

- AC adaptor or voltage regulator
- Multimeter

2. Adjustment procedure

- Make sure

VCC3	(CP110) = 3.3 ± 0.1 [V]
VCC3-M	(CP111) = 3.4 ± 0.2 [V]
VCC5	(CP115) = 5.0 ± 0.15 [V]
VCC7	(CP950) = $8.0^{+0.6}_{-0.7}$ [V]

3. Note

When unable to adjust using AC adaptor, use voltage regulator and supply power to be VCC1-1, 2, 3 = 5.0 ± 0.05 V.

5-2. VCC15, VEE7 Voltage check

1. Preparation

- AC adaptor or voltage regulator
- Multimeter

2. Adjustment procedure

Adjust VR100 so that VCC15 (CP118) = 15.0 ± 0.1 [V] and make sure that VEE7 (CP117) = -7.5 ± 0.2 [V].

3. Notes

When unable to adjust using AC adaptor, use voltage regulator and supply power to be VCC1-1 (CP107) = 5.0 ± 0.05 V.

5-3. BL drive voltage adjustment

1. Preparation

- AC adaptor or voltage regulator
- Multimeter

2. Adjustment procedure

Make sure that BL-VCC (CP910) is within 5.0 ± 0.05V.

3. Notes

When unable to adjust using AC adaptor, use voltage regulator and supply power to be VCC-1-1 (CP107) = 5.0 ± 0.05 V.

DISASSEMBLY/ASSEMBLY

1. Put on the lens cap in order to protect scratches on the lens.



2. Open the battery cover and remove one screw (BT3 panhead 1.4x3.5 black).



3. Remove one screw (BT3 flathead 1.7x3.5 Ni) from the bottom of the camera.



4. Slide the CN cover and remove one screw (BT3 flathead 1.7x3.5 Ni).



5-1. Remove two screws (BT3 flathead 1.7x4.0 black) from the side of the camera.
First screw



5-2. Second screw



5-3. When you assemble the case, screw it while CF cover is open for better fitting.



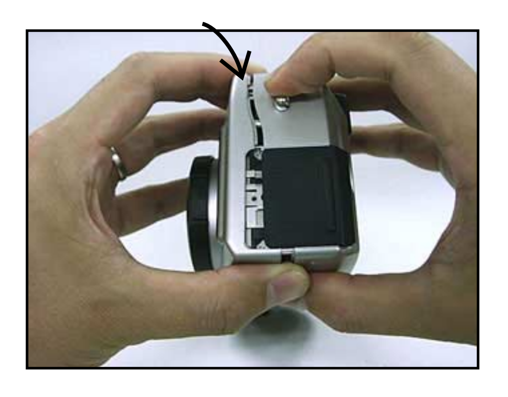
6-1. Open the battery cover. Open the case.



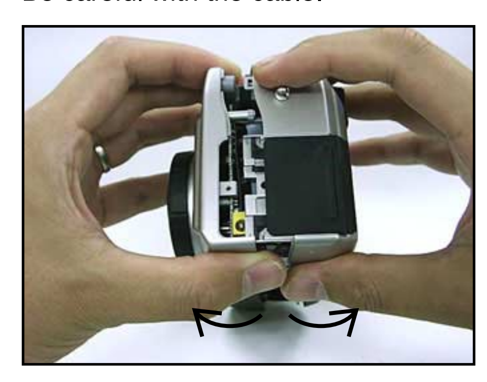
6-2. Open the case as shown on the figure.



7-1. Open the case from CN cover side. It is easier to open while pushing the upper part of the strap pin.



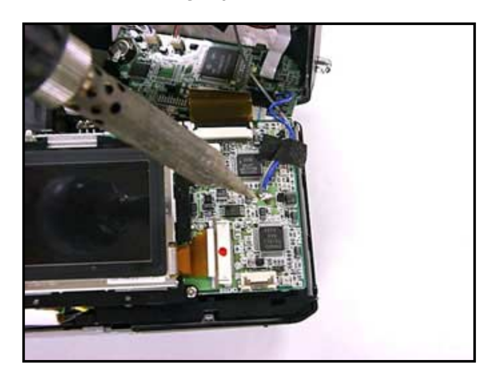
7-2. When the case opens a little, open it from the bottom.
Be careful with the cable.



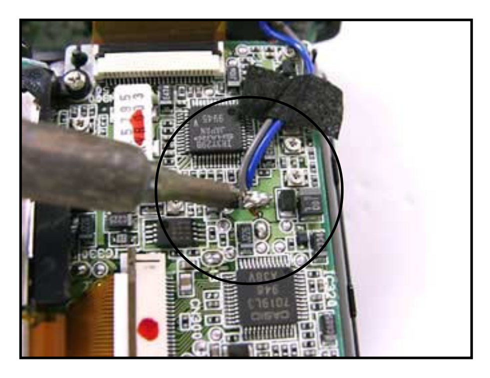
7-3. The figure shows the opened case.



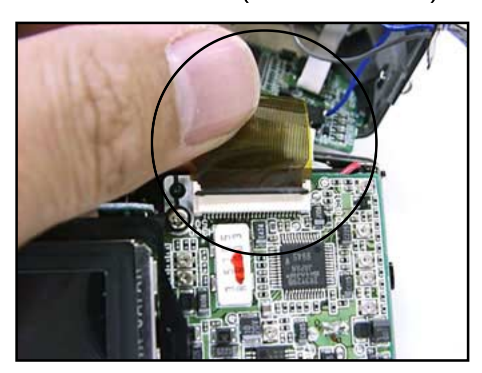
8-1. Desolder the gray and blue wires from D PCB.



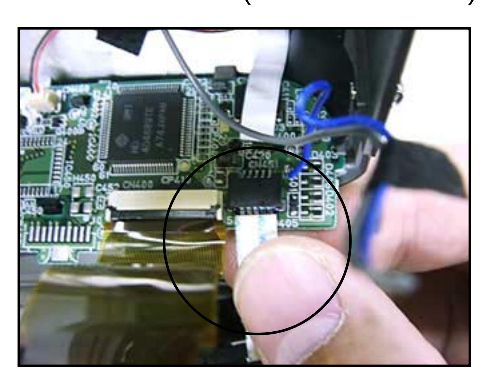
8-2. Enlarged



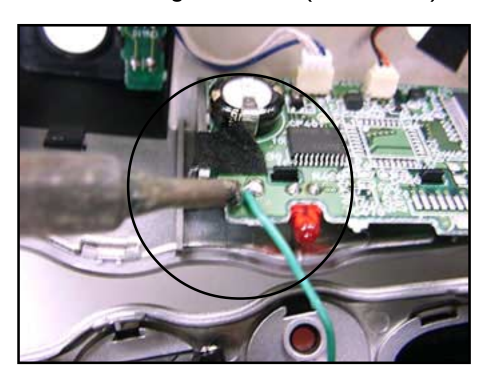
9. Remove the cable (D PCB/ CN550).



10. Remove the cable (SUB PCB/ CN451).



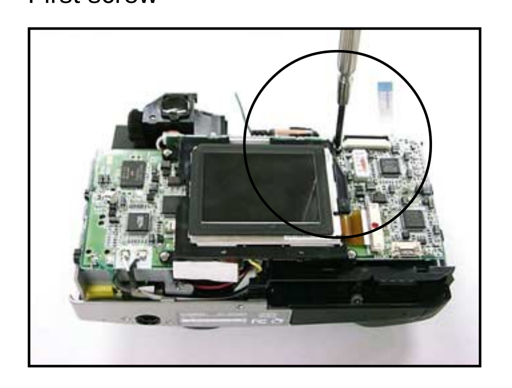
11. Remove the green wire (SUB PCB).



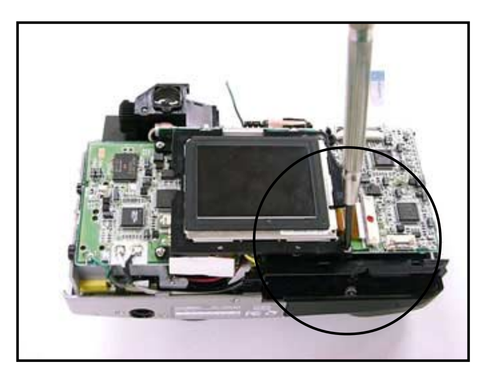
12. Separated Upper and Lower cases.



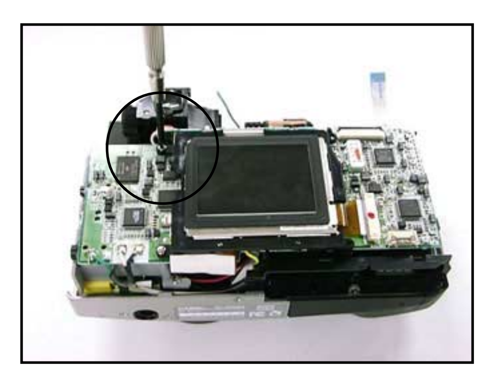
13-1. Remove four screws (BT3 panhead 1.7 x 5.0 Ni) that affixing the Display ass'y.
First screw



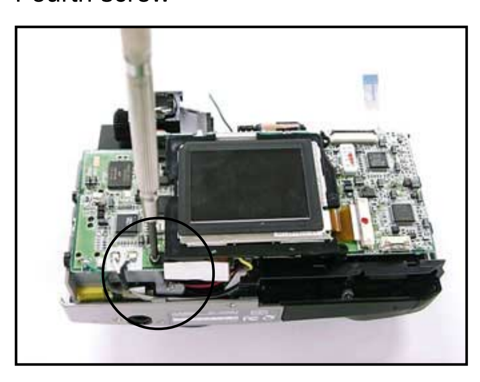
13-2. Second screw



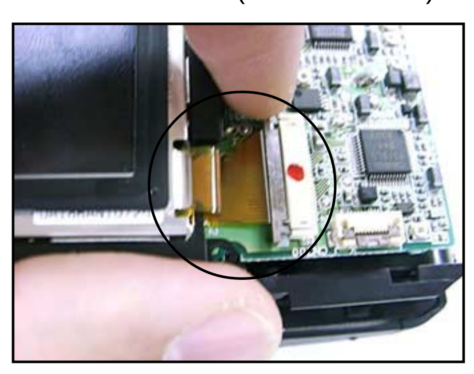
13-3. Third screw



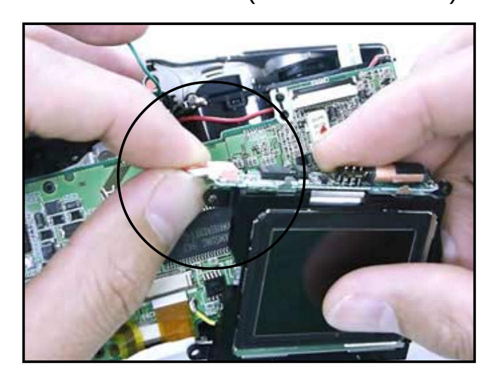
13-4. Fourth screw



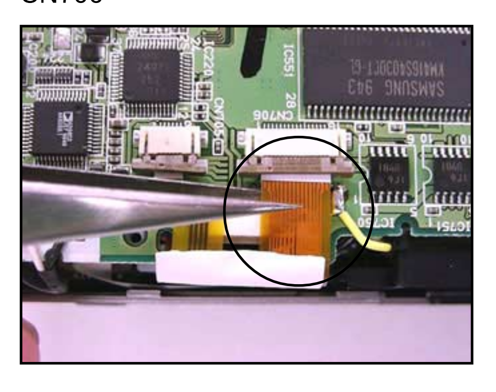
14. Remove the cable (D PCB/ CN300).



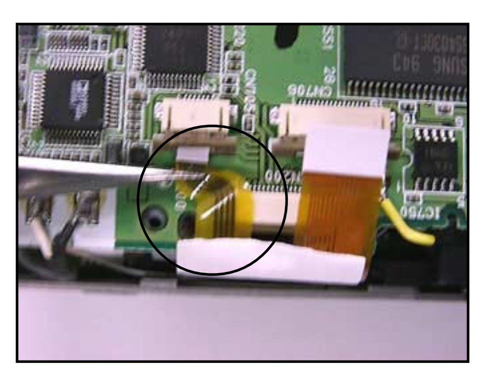
15. Remove the cable (BL PCB/ CN900).



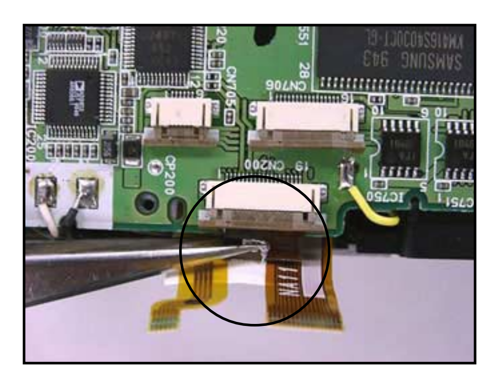
16-1. Disconnect three cables (D PCB).
CN706



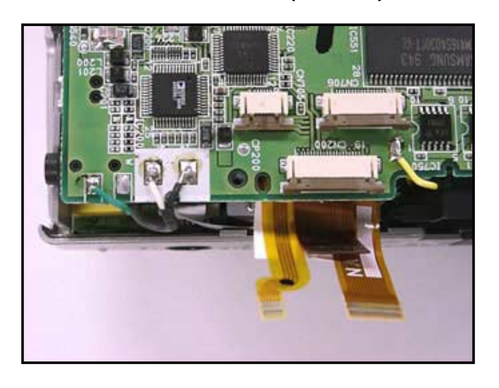
16-2. CN705



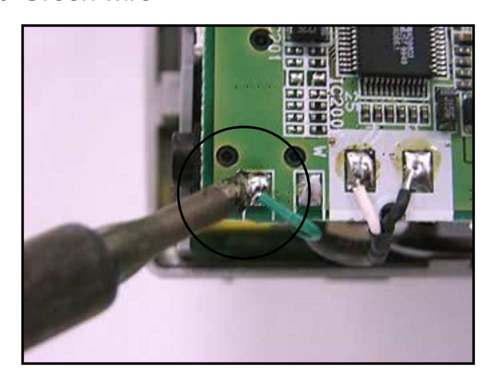
16-3. CN200



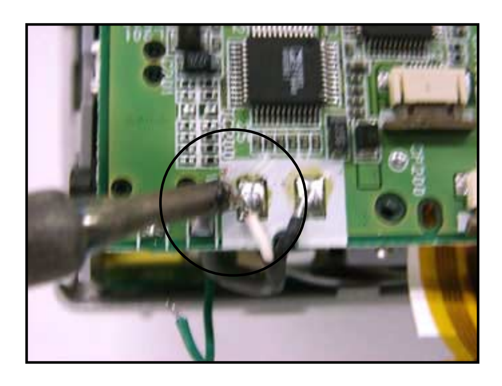
17-1. Disconnect four wires (D PCB).



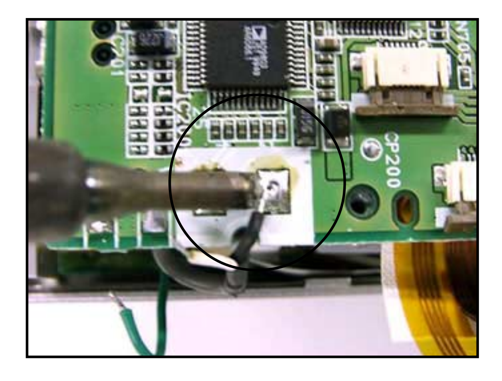
17-2. Green wire



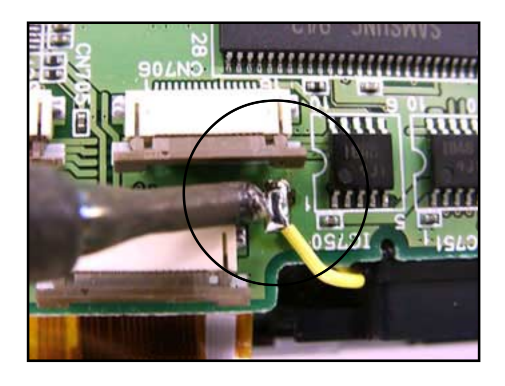
17-3. White wire



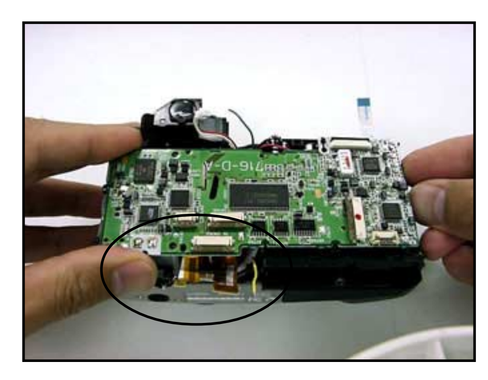
17-4. Black wire



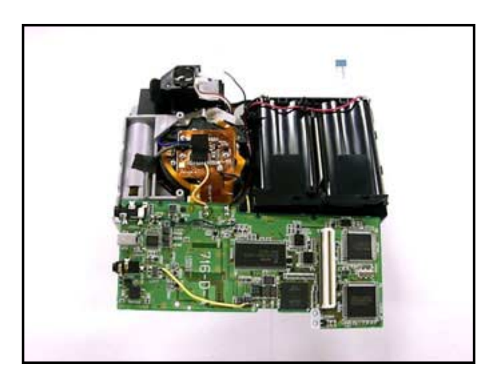
17-5. Yellow wire



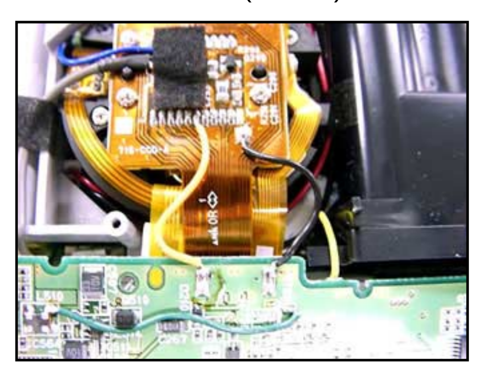
18-1. Remove D PCB by opening it from the upper part.
Caution:
Be careful with the cable under the PCB.



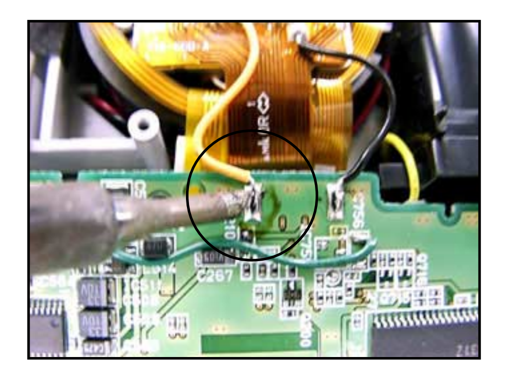
18-2. When Lower case and D PCB are removed.



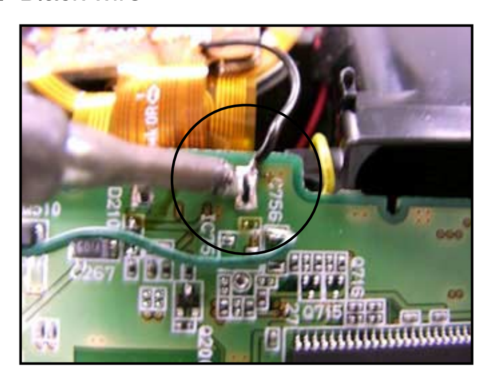
19-1. Remove two wires (D PCB).



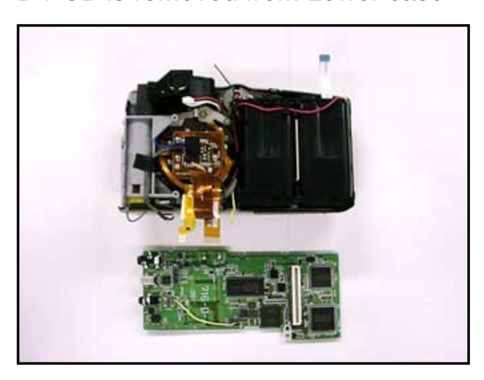
19-2. Orange wire



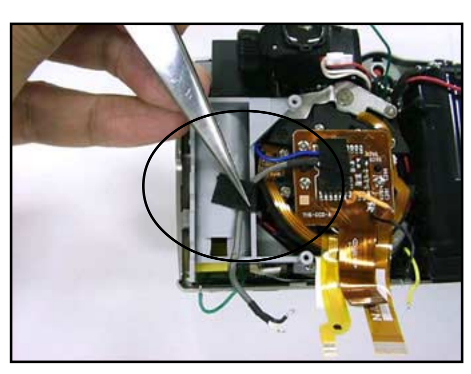
19-3. Black wire



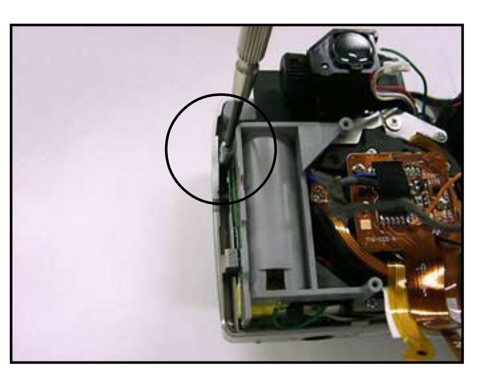
20. D PCB is removed from Lower case.



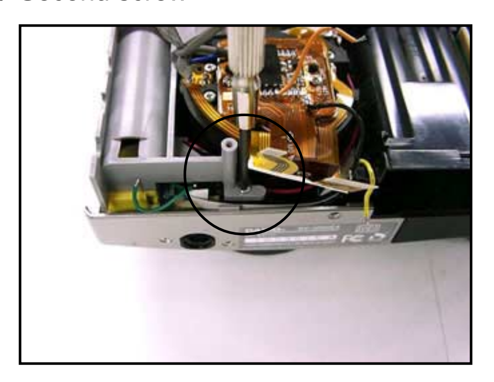
21. Peel off the cloth on J frame.



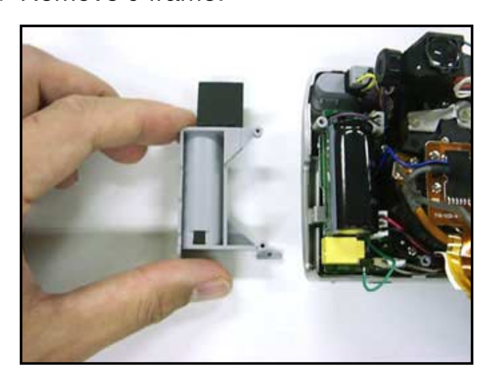
22-1. Remove two screws (BT3 panhead 1.7x5.0 Ni) from J frame.
First screw



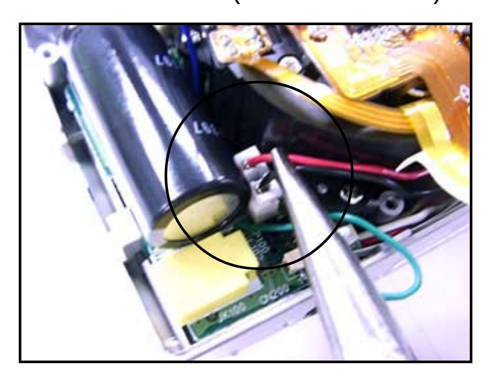
22-2. Second screw



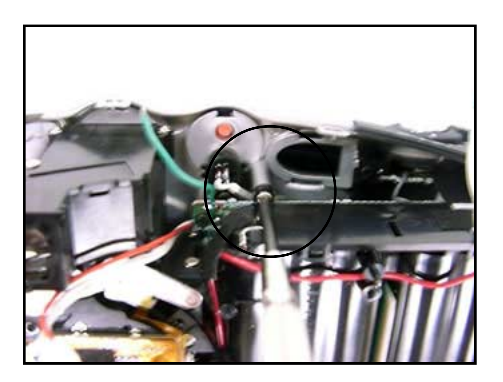
23. Remove J frame.



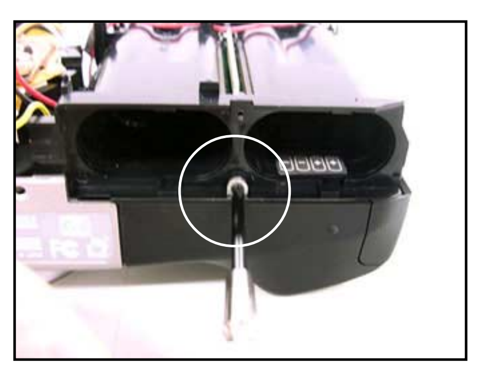
24. Disconnect cable (SJ PCB/ CN100).



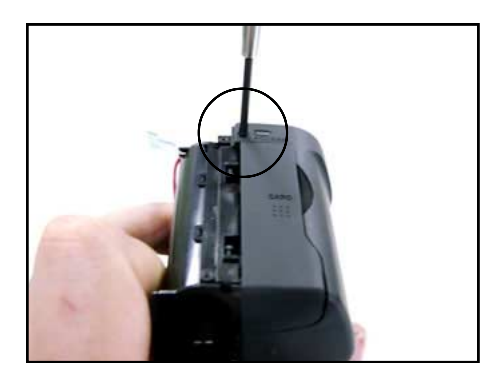
25. Remove one screw (BT3 panhead 1.7 x 5.0 Ni) from Battery frame.



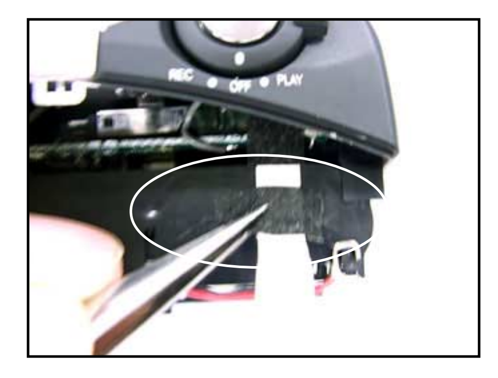
26. Remove one screw (BT3 panhead 1.4 x 3.5 Black) from Battery frame.



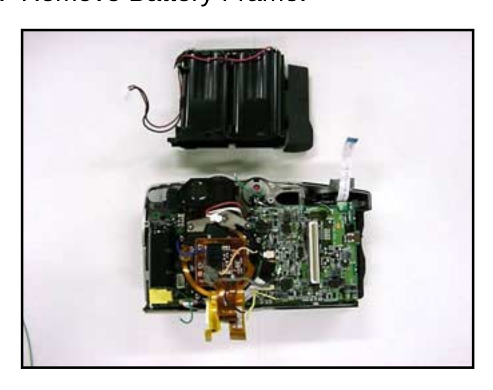
27. Remove one screw (BT3 flathead 1.7 x 4.0 Black) from side body.



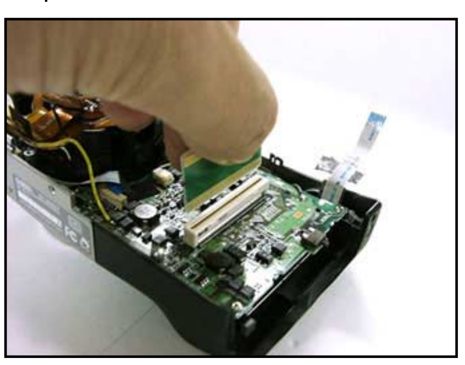
28. Peel the cloth tape that affix the cable.



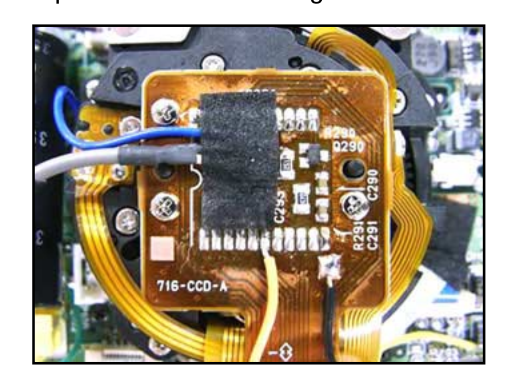
29. Remove Battery Frame.



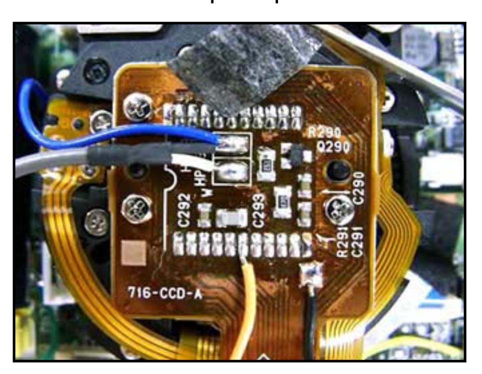
30. Displace BB PCB.



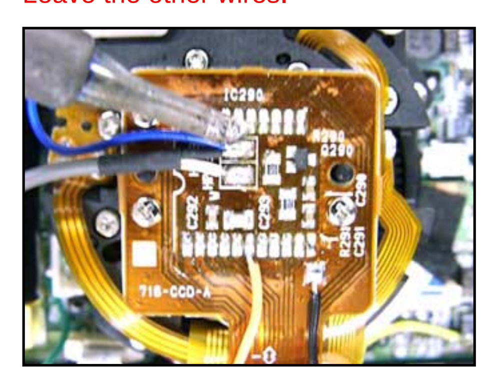
31-1. Peel cloth tape from CCD block.
Caution:
When you assemble, set the lead wires and cloth tape as shown on the figure below.



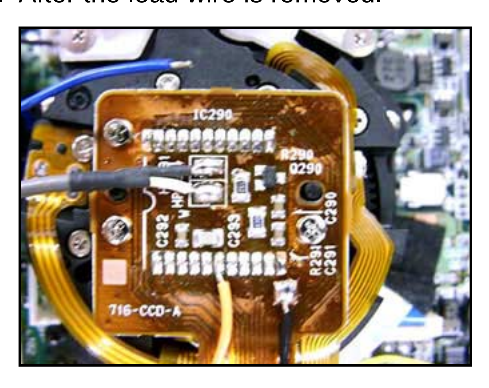
31-2. After the cloth tape is peeled off.



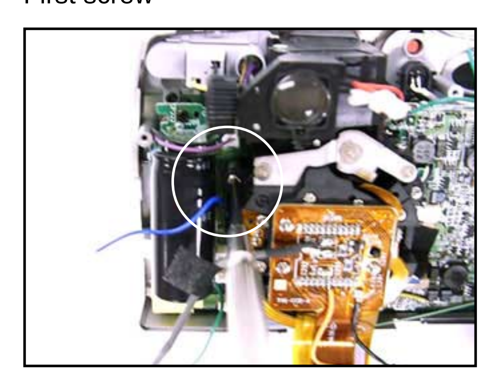
32-1. Disconnect the lead wire from CCD PCB.
Caution:
Leave the other wires.



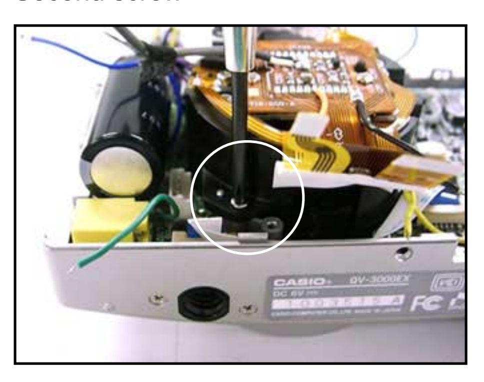
32-2. After the lead wire is removed.



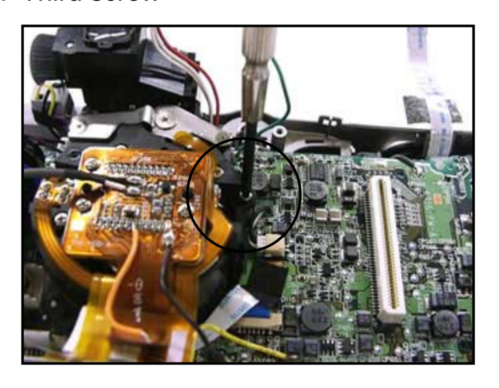
33-1. Remove three screws (BT3 panhead 1.7 x 5.0 Ni) which affix CL unit.
First screw



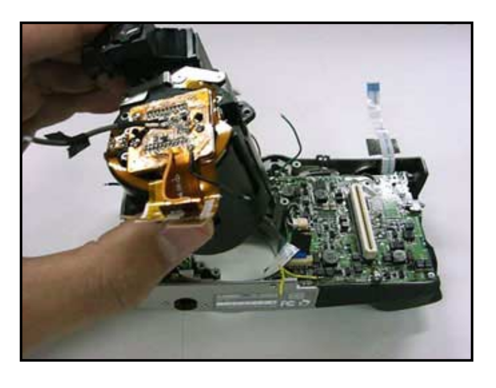
33-2. Second screw



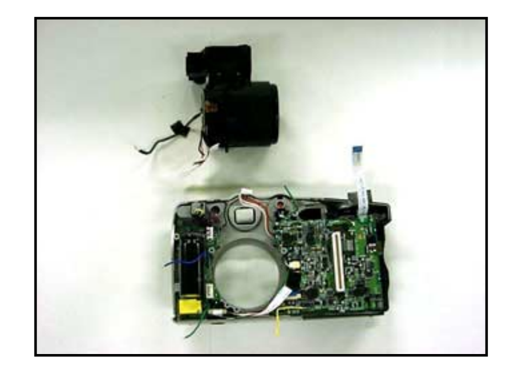
33-3. Third screw



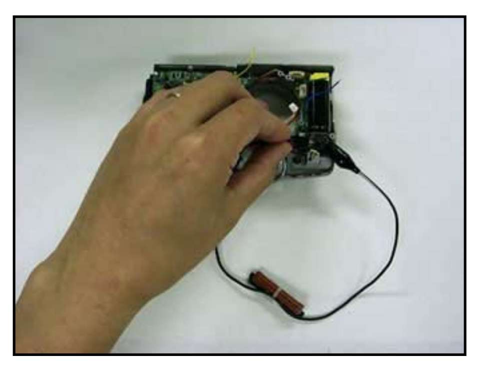
34. Remove CL unit.



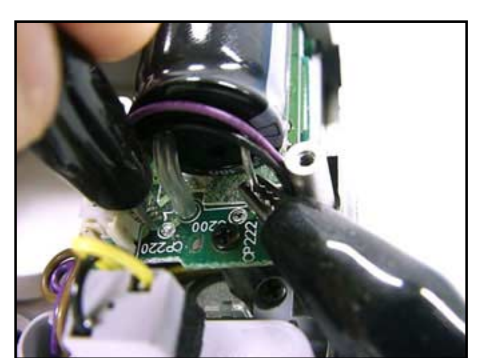
35. After removal of CL unit.



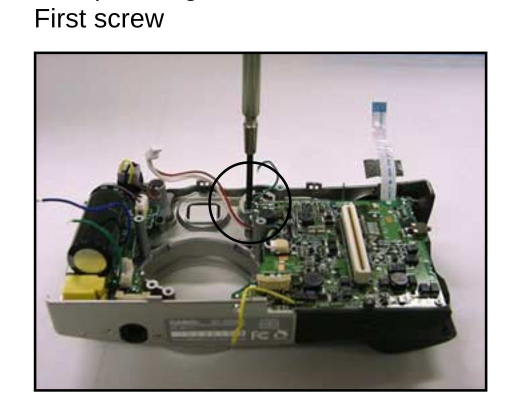
36-1. Discharge the capacitor for the flash via 1.5kohm, 5W resistor.



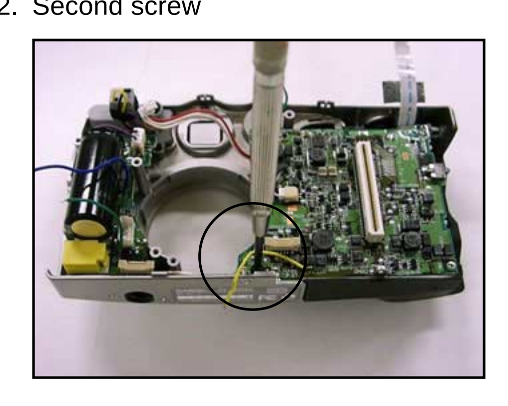
36-2. Connect the discharging jig between negative lead of the capacitor and check pad CP220.



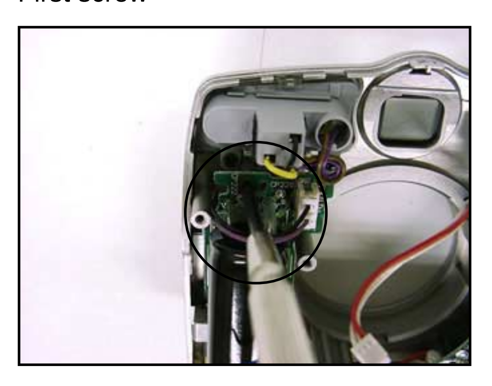
37-1. Remove two screws (BT3 panhead 1.7 x 3.5 black) affixing PW PCB.
First screw



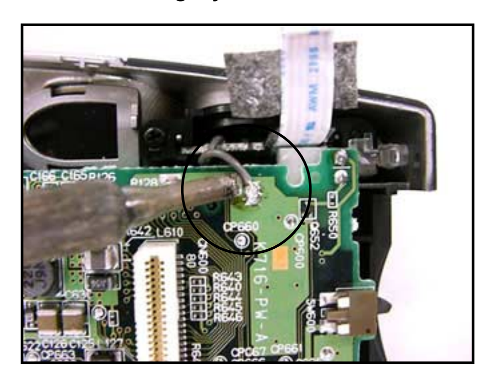
37-2. Second screw



38-1. Remove two screws (BT3 panhead 1.7 x 3.5 black) from SJ PCB.
First screw

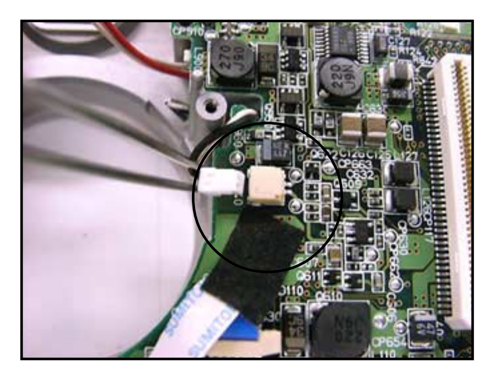


38-2. Second screw

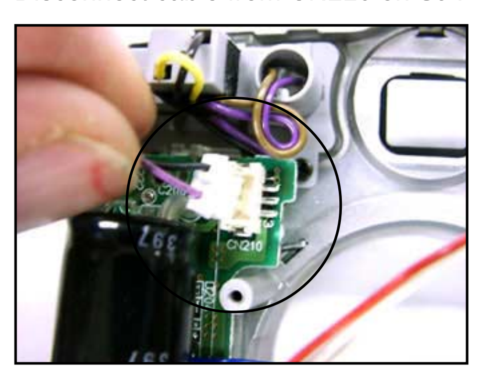


39. Remove the gray lead wire from PW PCB.

40. Disconnect cable from CN640 on PW PCB.
Caution:
Be careful for wire arrangement when you assemble.



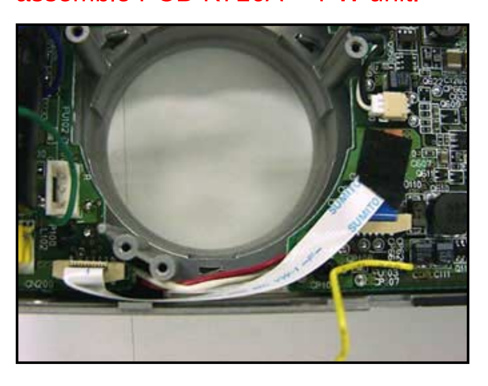
41. Disconnect cable from CN210 on SJ PCB.



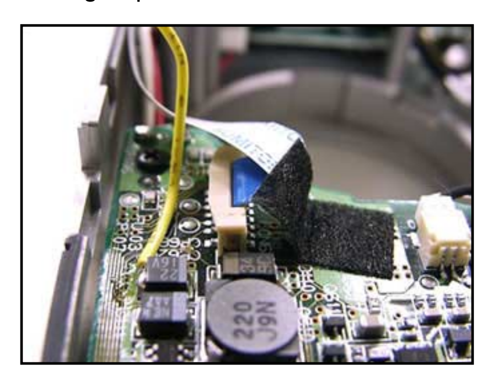
42-1. Remove PW and SJ PCBs.
These two PCBs are provided as a set for spare parts.
(PCB-K716A-PW unit)



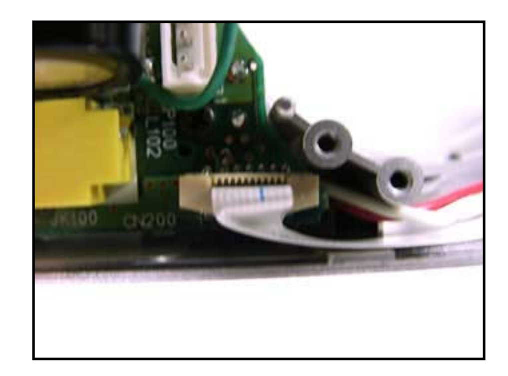
42-2. Be careful for cable arrangement when you assemble PCB-K716A- PW unit.



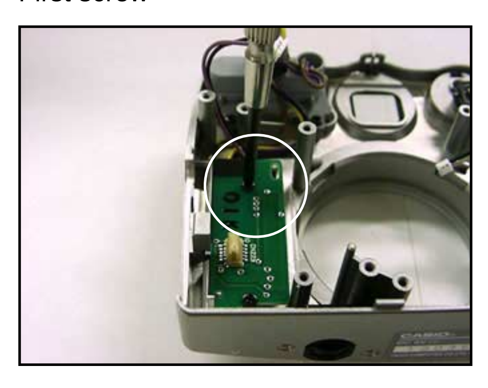
42-3. Enlarged picture of CN630 on PW PCB.



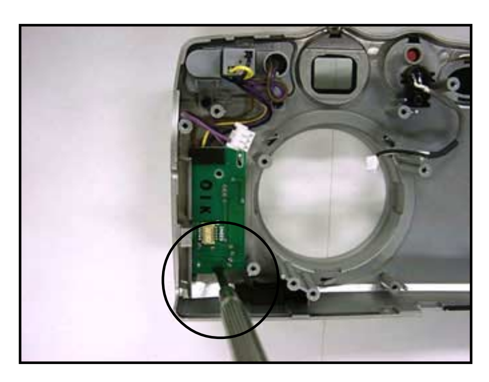
42-4. Enlarged picture of CN200 on SJ PCB.
Caution:
Incomplete insertion of the cable will break IGBT on flash PCB.



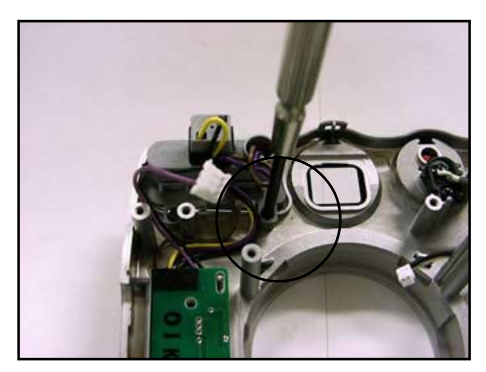
43-1. Remove four screws (BT3 panhead 1.7 x 3.5 Black) which affix Flash unit.
First screw



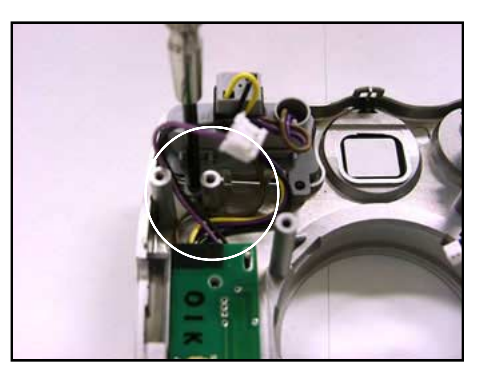
43-2. Second screw



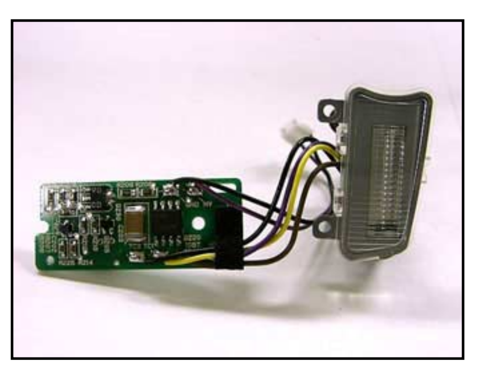
43-3. Third screw



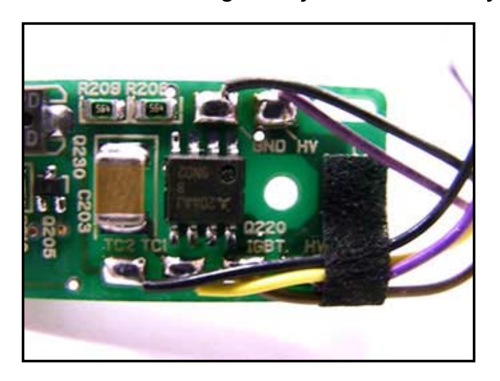
43-4. Fourth screw



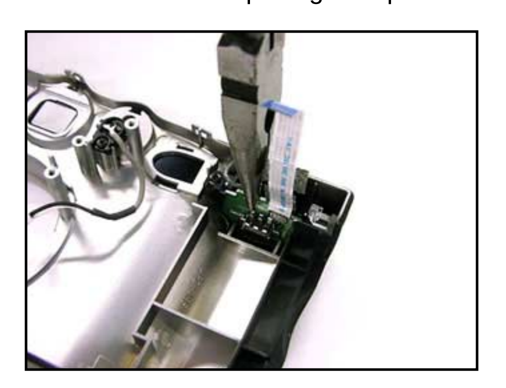
44. Remove Flash unit.
The 2-pin cable is not included in Flash unit.



45. If this IGBT (Q220) is faulty, flash may light with full emission or light only once on red-eye mode.



46-1. Remove SW PCB pulling with pliers.



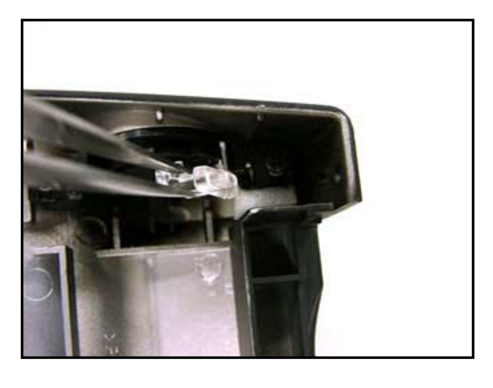
46-2. After removal of SW PCB.



47-1. Remove LED cover.
Use tweezers. It is stuck with both sided tape.



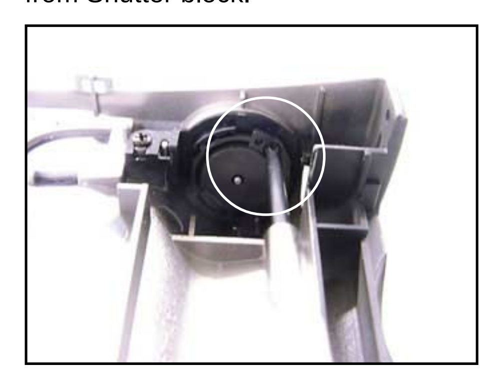
47-2. After removal of LED cover.



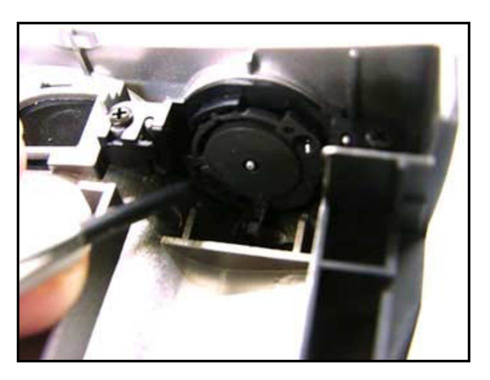
47-3. Caution:
When you assemble, be sure that LCD cover and case are level.



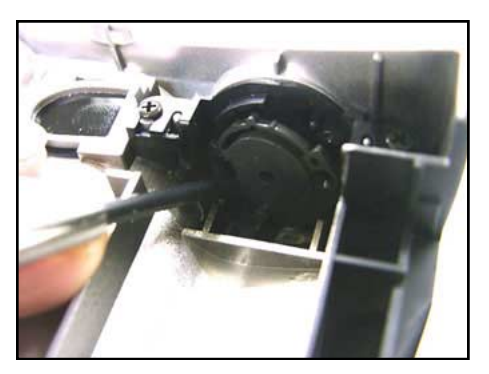
48. Remove one screw (BT3 flathead 1.4 x 4.0 Black) from Shutter block.



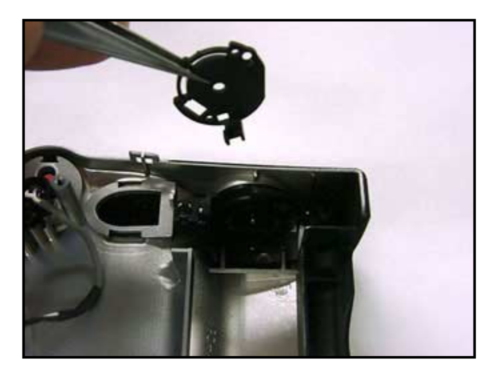
49-1. Remove the hook.



49-2. After removal of the hook.



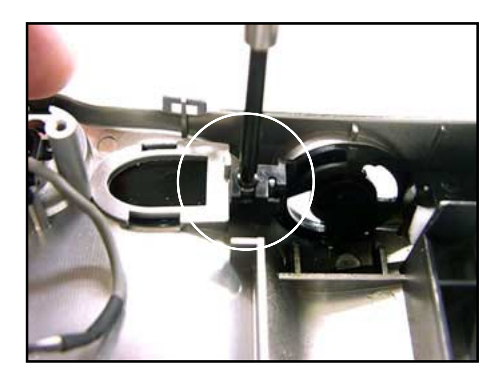
50. Pull click gear off.



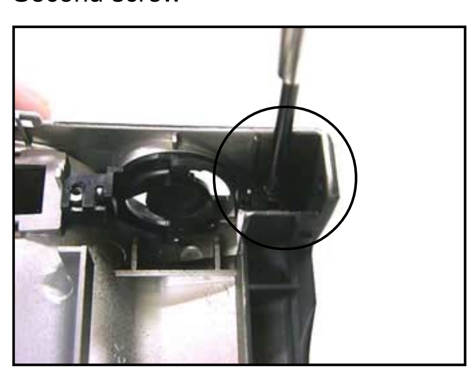
51. Remove REC knob, shutter button, and shutter spring



52-1. Remove two screws (BT3 panhead 1.7 x 3.5 Black) which affixing shutter base.
First screw



52-2. Second screw



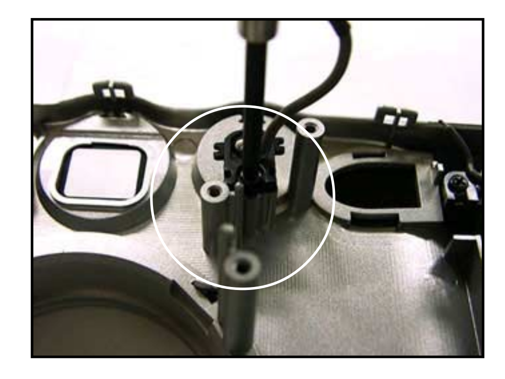
53. Remove shutter base.



54. Shutter block parts



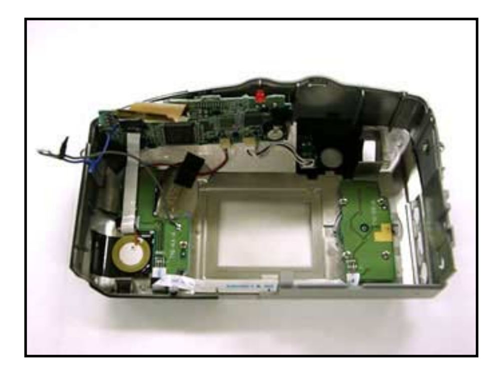
55. Remove one screw (BT3 panhead 1.7 x 3.5 Black) which affixes ST sensor unit.



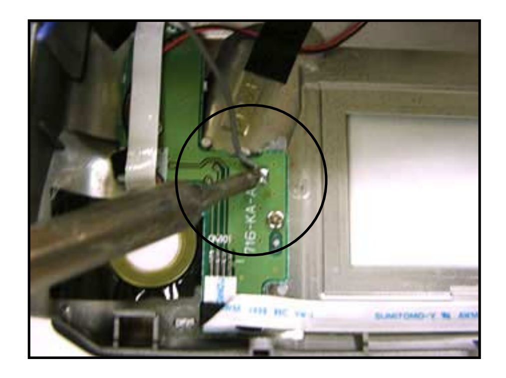
56. Remove ST sensor unit.



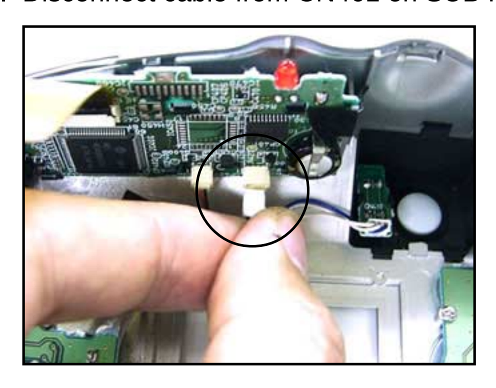
57. Upper case ass'y



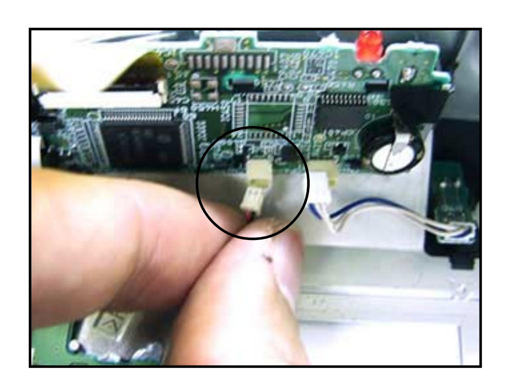
58. Disconnect gray lead wire from KA PCB.



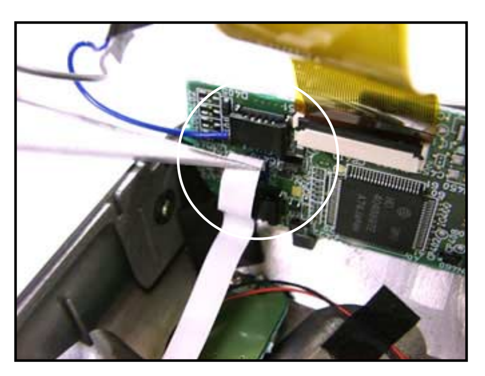
59. Disconnect cable from CN461 on SUB PCB.



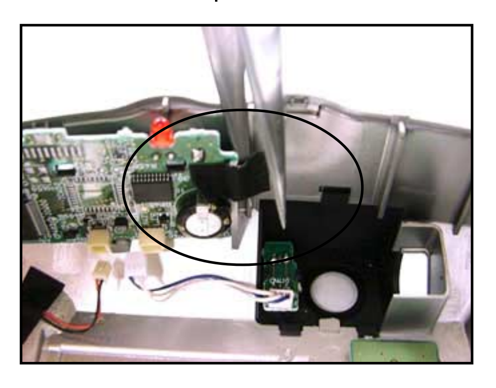
60. Disconnect cable from CN460 on SUB PCB.



61. Disconnect cable from CN451 on SUB PCB.



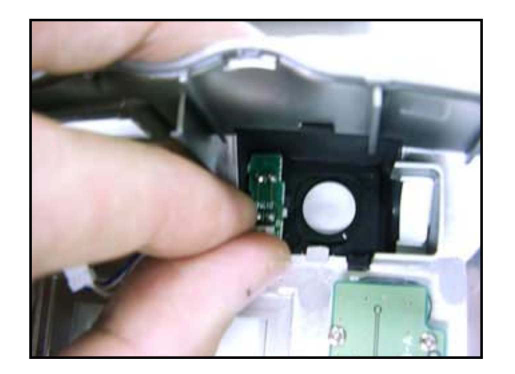
62. Peel the cloth tape.



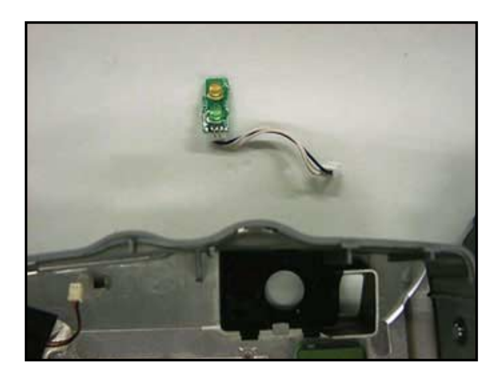
63. Displace SUB PCB.



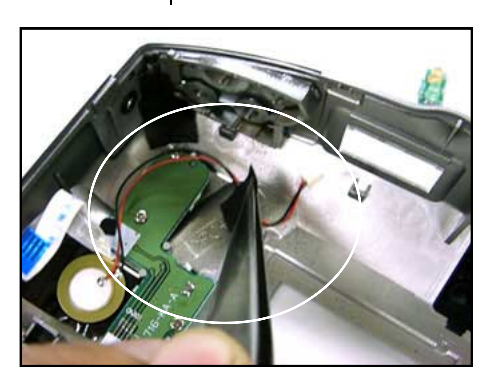
64-1. Remove LED PCB by unhooking tow hooks.



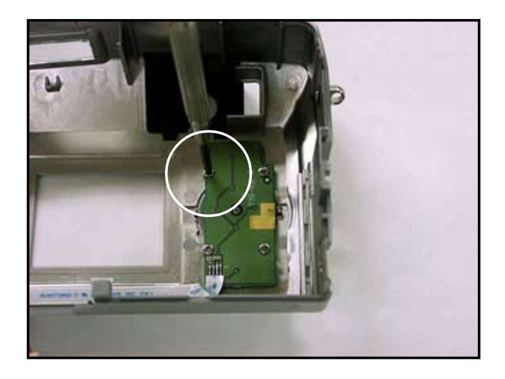
64-2. LED PCB outer wire



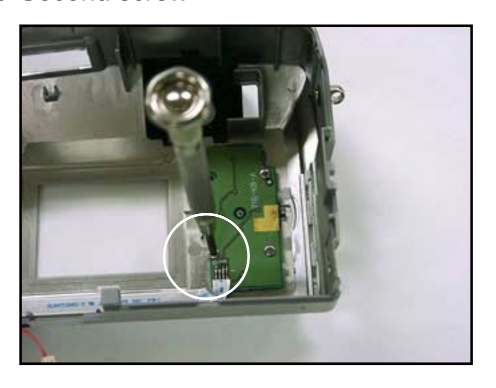
65. Peel cloth tape from buzzer lead wire.



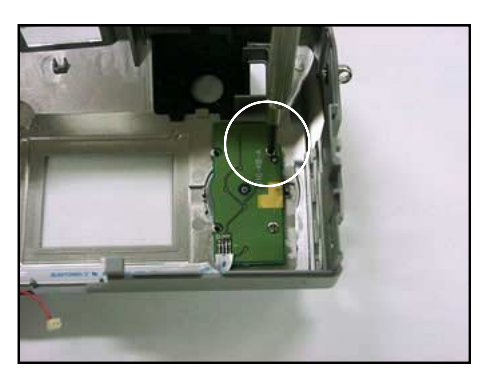
66-1. Remove four screws (BT3 panhead 1.7 x 3 Ni) which affix KB PCB.
First screw



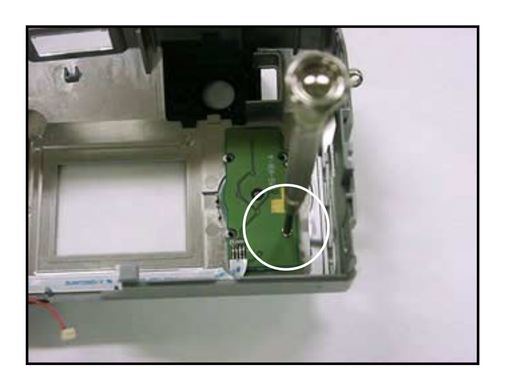
66-2. Second screw



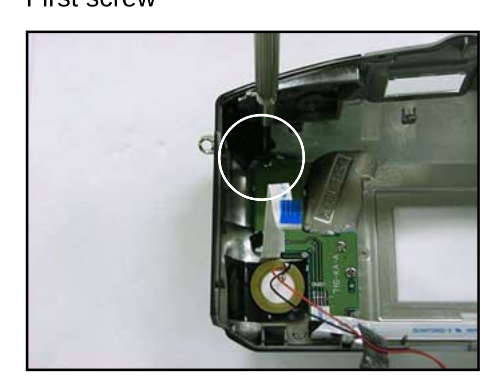
66-3. Third screw



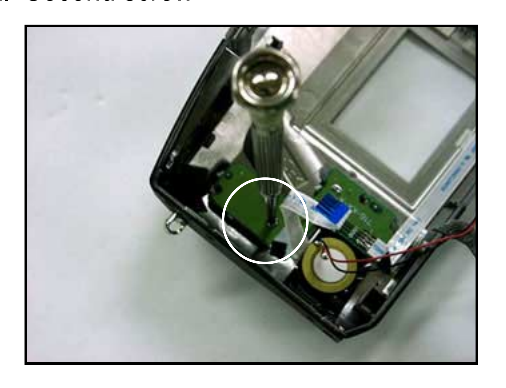
66-4. Fourth screw



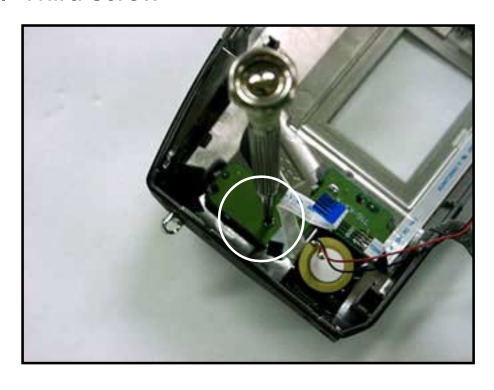
67-1. Remove three screws (BT3 panhead 1.7 x 3 Ni) from KA PCB.
First screw



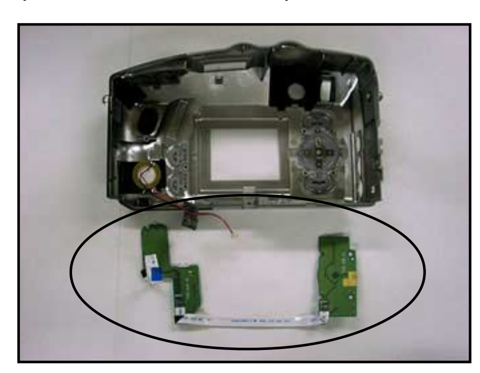
67-2. Second screw



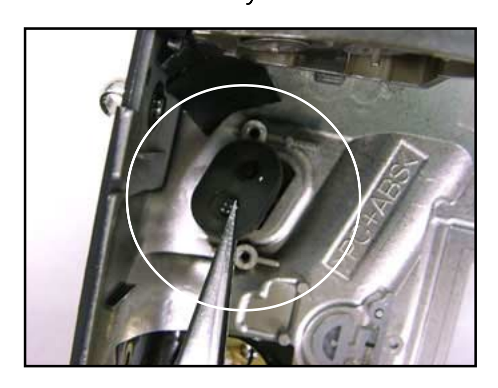
67-3. Third screw



68. Remove KA and KB PCBs.
These PCBs are provided as a set as spare part.
(PCB-K716A-KEY unit)



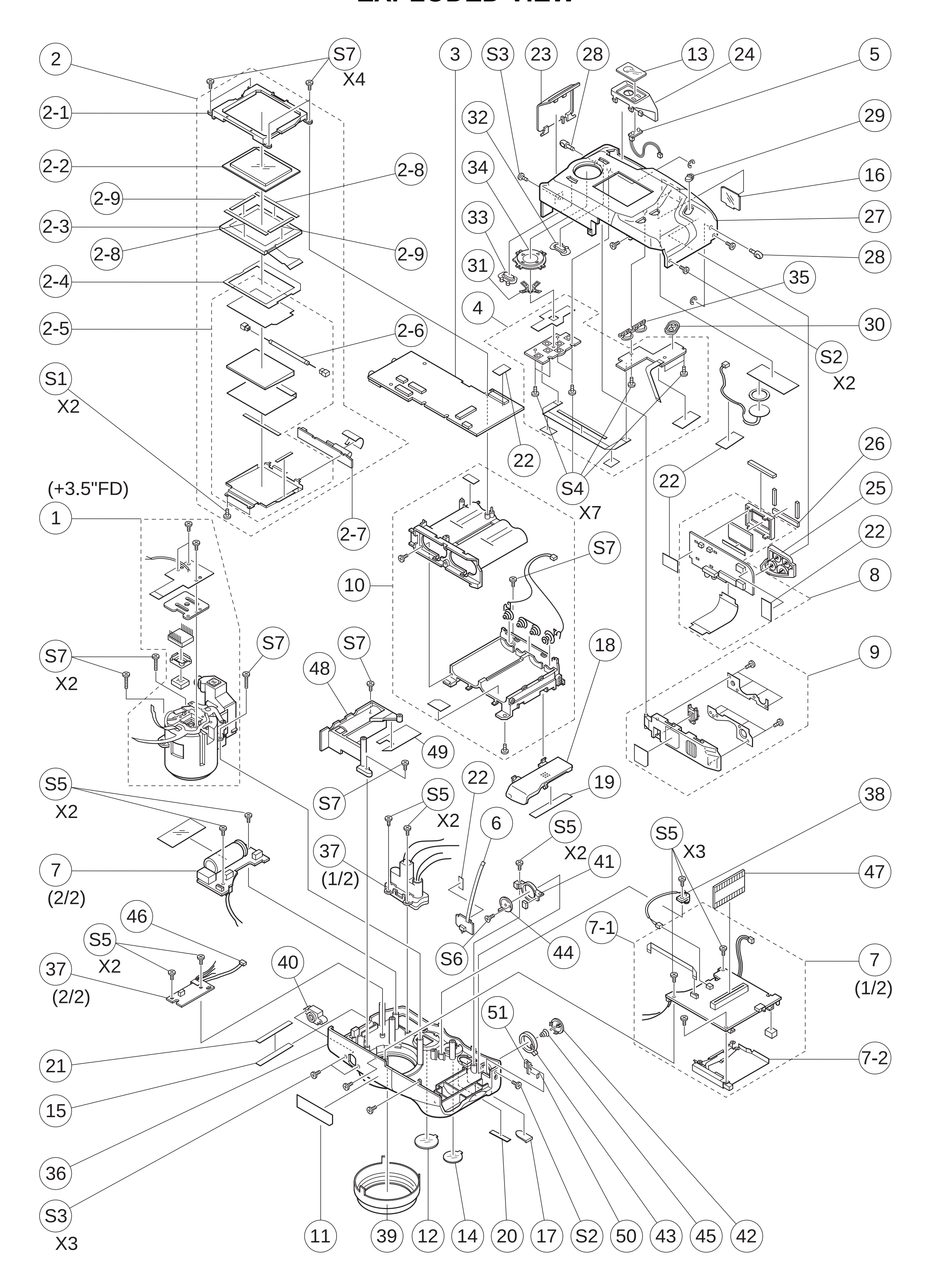
69. Remove rubber key.



70. ZOOM knob



EXPLODED VIEW



PARTS PRICE LIST

MAIN BODY COMPONENT

N	Item	Code No.	Parts Name	Specification	Applicable	Q	Price Code	R
N	1	1001 5687	LENS UNIT	K342105*1 TK(K716)	Common	1	EJ	A
N	2	1001 5690	DISPLAY ASSY	K342106*1 TK(K716)	Common	1	CW	B
-	2-1	6614 4530	FRAME/DISPAY	K241200-1	Common	1	AC	X
N	2-2	1001 1751	PANEL/DISPLAY	K441760B-1	Common	1	AI	B
N	2-3	1001 2616	TFT-LCD MODULE	COD18T1035FN	Common	1	DE	B
-	2-4	6614 4540	SPACER/BACK LIGHT	K441763-1	Common	1	AA	X
N	2-5	1001 5719	BL ASSY	K342102*1 TK(K716)	Common	1	BV	B
-	2-6	3851 2113	LAMP/FLUORESCENT	CAS-1.8JS1.8-1	Common	1	AW	A
N	2-7	1001 5721	PCB ASSY/BACK LIGHT	K442091*1 TK(K716)	Common	1	BK	C
-	2-8	6614 4230	TAPE/DOUBLE SIDE	K441774-2	Common	2	AA	X
-	2-9	6614 4240	TAPE/DOUBLE SIDE	K441774-3	Common	2	AA	X
N	3	1002 5309	PCB ASSY/DIGITAL	K442303*1 TK(K716)	Common	1	EF	A
N	4	1001 5727	PCB ASSY/KEY	K342098*1 TK(K716)	Common	1	BN	B
N	5	1001 5723	PCB ASSY/LED	K241383*3 TK(K716)	Common	1	CN	B
N	6	1001 5722	PCB ASSY/SW	K241383*4 TK(K716)	Common	1	CM	B
N	7	1001 5704	PCB ASSY/POWER	K342100*1 TK(K716)	Common	1	CZ	A
N	7-1	1000 8870	CABLE/FLAT	K441943-1	Common	1	AE	X
-	7-2	1015 1467	EJECTOR UNIT/CF	55370-0011	Common	1	AY	X
N	8	1001 5696	PCB ASSY/SUB	K342099*1 TK(K716)	US	1	CO	B
N	8	1001 5693	PCB ASSY/SUB	K342099*2 TK(K716)	Except for US	1	DB	B
N	9	1001 5698	BATTERY COVER ASSY	K342097*1 TK(K716)	Common	1	AU	B
N	10	1001 5702	FRAME ASSY/BT	K342096*1 TK(K716)	Common	1	BA	X
N	11	1001 4270	PLATE/RATING	K442081-1	US	1	AA	X
N	11	1001 2557	PLATE/RATING	K442081-2	Except for US	1	AA	X
N	12	1000 8856	COVER/FD-A	K441951-1	Common	1	AD	X
N	13	1000 8857	COVER/FD-B	K441952-1	Common	1	AD	X
N	14	1000 8858	COVER/SENSOR	K441953-1	Common	1	AC	X
N	15	1000 8832	GRIP	K441954-1	Common	1	AD	X
N	16	1001 1750	PANEL/DISPLAY	K441761A-1	Common	1	AC	X
N	17	1000 8843	COVER/IR	K341801-1	Common	1	AB	X
N	18	1001 2554	COVER/CF	K341795-1	Common	1	AE	X
N	19	1001 2556	LABEL/CF	K441888-2	Common	1	AA	X
-	20	6611 0460	PLATE/CASIO	C441170-1	Common	1	AG	X
N	21	1001 2559	TAPE/DOUBLE SIDE	K442202-2	Common	1	AA	X
-	22	6601 1700	SHEET/INSULATION	K4117-3	Common	5	AA	X
N	23	1000 8847	COVER/CN	K241206-2	Common	1	AE	X
N	24	1000 8835	CASE/FD	K241308-1	Common	1	AF	X
N	25	1000 8836	BUTTON/MODE	K341797-1	Common	1	AH	X
N	26	1001 2586	CUSHION	K442203-1	Common	1	AA	X
N	27	1000 8828	CASE/UPPER	K140665-1	US	1	BY	X
N	27	1001 2583	CASE/UPPER	K140665-2	Except for US	1	BY	X
N	28	1000 8852	PIN/STRAP	K441949-1	Common	2	AG	X
N	29	1000 8849	KNOB/ZOOM	K341852-1	Common	1	AA	B
-	30	6614 5000	RUBBER KEY	K341614-1	Common	1	AA	X
-	31	6614 5060	SPRING/CS	K441749-1	Common	1	AB	X
-	32	6614 5030	BUTTON/MENU	K341606-1	Common	1	AE	X

Notes: N : New registration parts
Q : Quantity used per unit
R : Rank

N	Item	Code No.	Parts Name	Specification	Applicable	Q	Price Code	R
-	33	6614 5040	BUTTON/SET	K341607-1	Common	1	AE	X
-	34	6614 5050	BUTTON/CS	K341608-1	Common	1	AE	X
-	35	6614 5020	BUTTON/POWER	K341610-1	Common	1	AF	X
N	36	1000 8829	CASE/LOWER	K140666-1	Common	1	BW	X
N	37	1000 8859	STROBE UNIT	CO-716	Common	1	BW	A
N	38	1000 8862	STROBE SENSOR UNIT	CO-716SU	Common	1	AX	C
N	39	1000 8851	COVER/LENS	K441958-1	Common	1	BA	X
-	40	6613 1210	NUT/TRIPOD	K341059-1	Common	1	AC	X
N	41	1000 8839	BASE/SHUTTER	K241297-1	Common	1	AC	X
N	42	1000 8837	BUTTON/SHUTTER	K341798-1	Common	1	AG	X
N	43	1000 8838	KNOB/REC	K341799-1	Common	1	AF	X
N	44	1000 8840	GEAR/CLICK	K341800-1	Common	1	AA	X
-	45	6613 9110	SPRING/SHUTTER	K441649-1	Common	1	AA	X
N	46	1001 2588	HARNESS/STROBE	K441994-1	Common	1	AB	X
-	47	6614 5210	PCB ASSY/BB	K441743-1	Common	1	AR	X
N	48	1000 8833	FRAME	K341794-1	Common	1	AC	X
N	49	1001 2597	PLATE/INTERCEPTION	K441955-1	Common	1	AA	X
N	50	1001 2594	TAPE/DOUBLE SIDE	K442202-1	Common	1	AA	X
-	51	6614 4410	COVER/LED	K341643-1	Common	1	AA	X
N	S1	1001 2608	SCREW	PS1 1.7X2.5 NI	Common	2	AA	X
N	S2	1001 2550	SCREW	BT3 1.7X3.5 BK	Common	3	AA	X
N	S3	5861 3530	SCREW	BT3 1.7X3.5NI	Common	4	AA	X
-	S4	5112 0884	SCREW	BT3 1.7X3 NI	Common	7	AA	X
-	S5	1001 2551	SCREW	BT3 1.7X3.5 BK	Common	11	AA	X
N	S6	1001 2589	SCREW	BT3 1.4X4.0 BK	Common	1	AA	X
N	S7	1001 2591	SCREW	BT3 1.7X5.0 NI	Common	10	AA	X

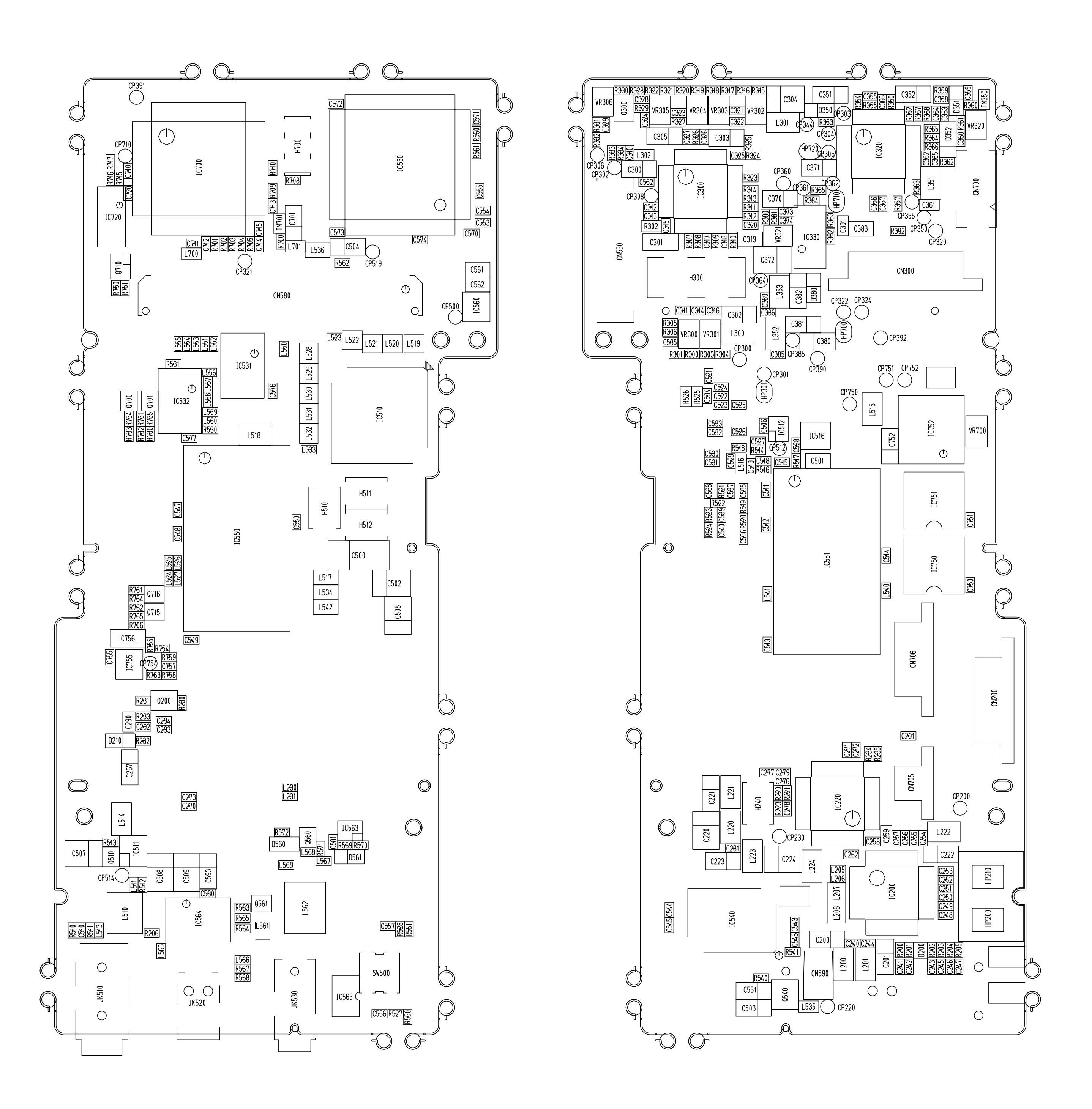
ACCESSORY

N	Item	Code No.	Parts Name	Specification	Applicable	Q	Price Code	R
N		1001 2568	CD-ROM	CK716DCA01R	Except for US	1	AK	X
-		1015 1424	CF CARD (8 MB)	HB289008C4QV	Except for US	1	CZ	C
-		3502 2744	CABLE/USB	59204-2301	Common	1	BK	C
N		1001 2567	HOLDER/CAP	CH-K716	Common	1	AF	X
N		1001 2566	STRAP	ST-K716	Common	1	BB	X
N		1001 2565	CASE/SOFT	SC-716	Common	1	BJ	X
-		1015 1471	CABLE/PC-LINK	LC9F-DOS-K740-L	Except for US	1	BU	X
-		1014 8773	CABLE/VIDEO	VC-K723-FC	Common	1	AR	X
N		1001 2569	CAP/LENS	K241332-1	Common	1	AC	C
-		3816 0266	BATTERY/ALKALINE	LR6PA/2ST	Except for US	2	AG	X

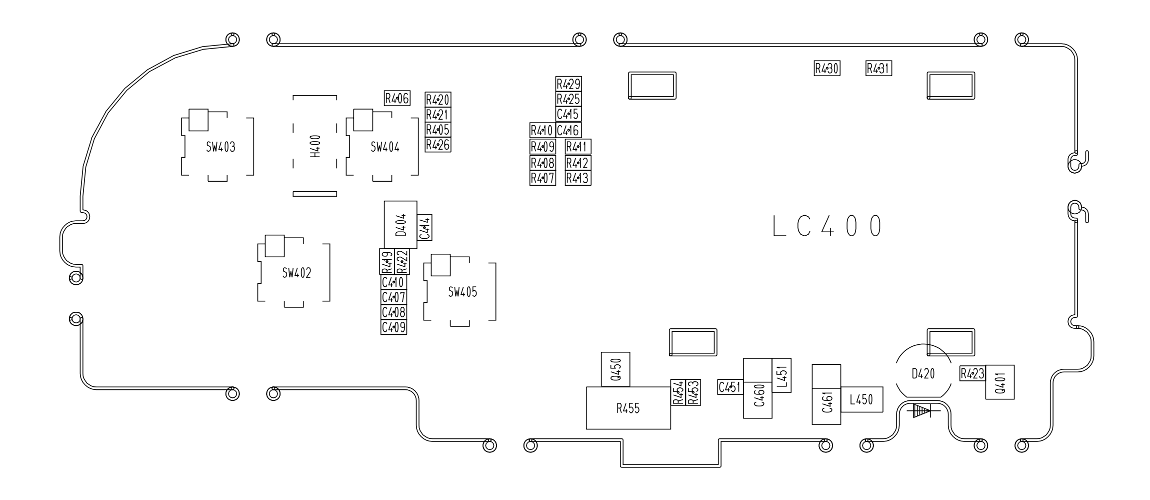
Notes: N : New registration parts
Q : Quantity used per unit
R : Rank

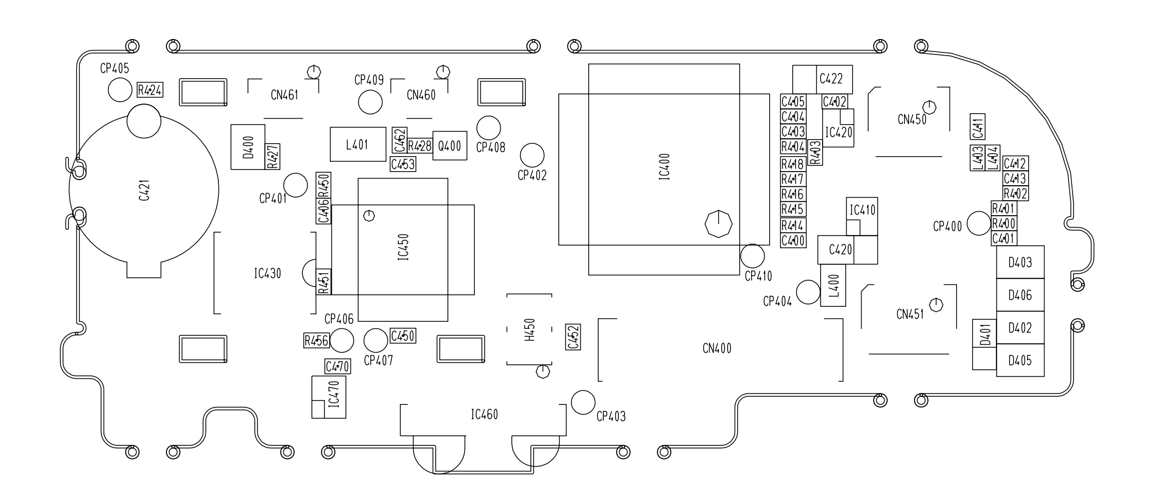
PRINTED CIRCUIT BOARDS

DIGITAL-PCB (PCB-716D-D)

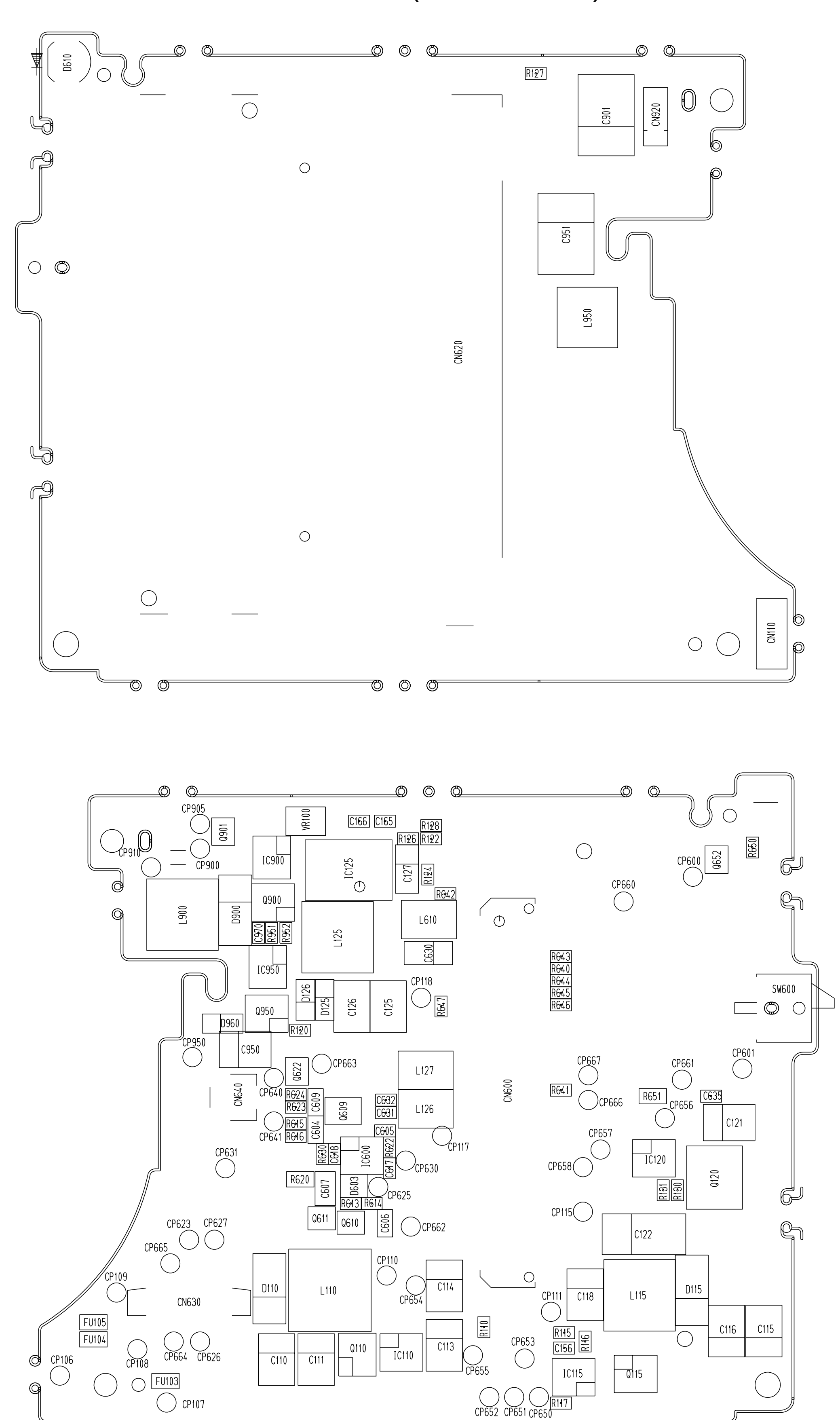


SUB-PCB (PCB-716D-SUB)

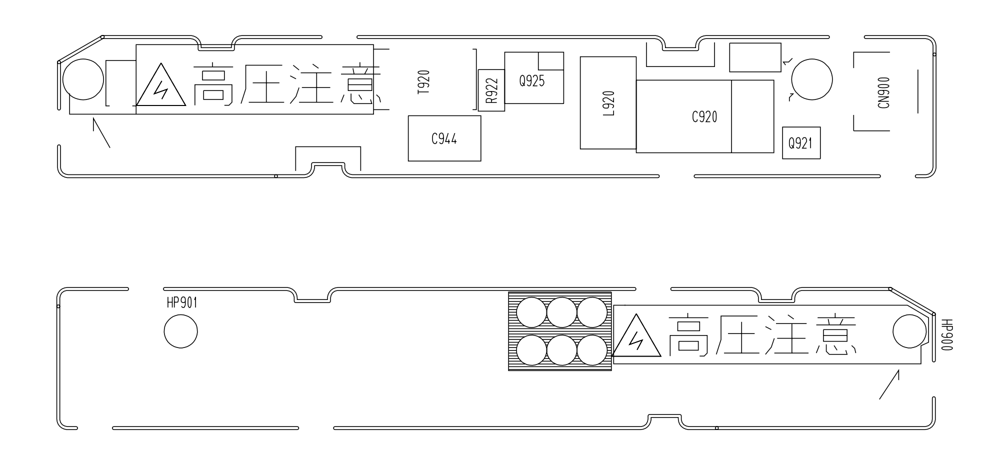




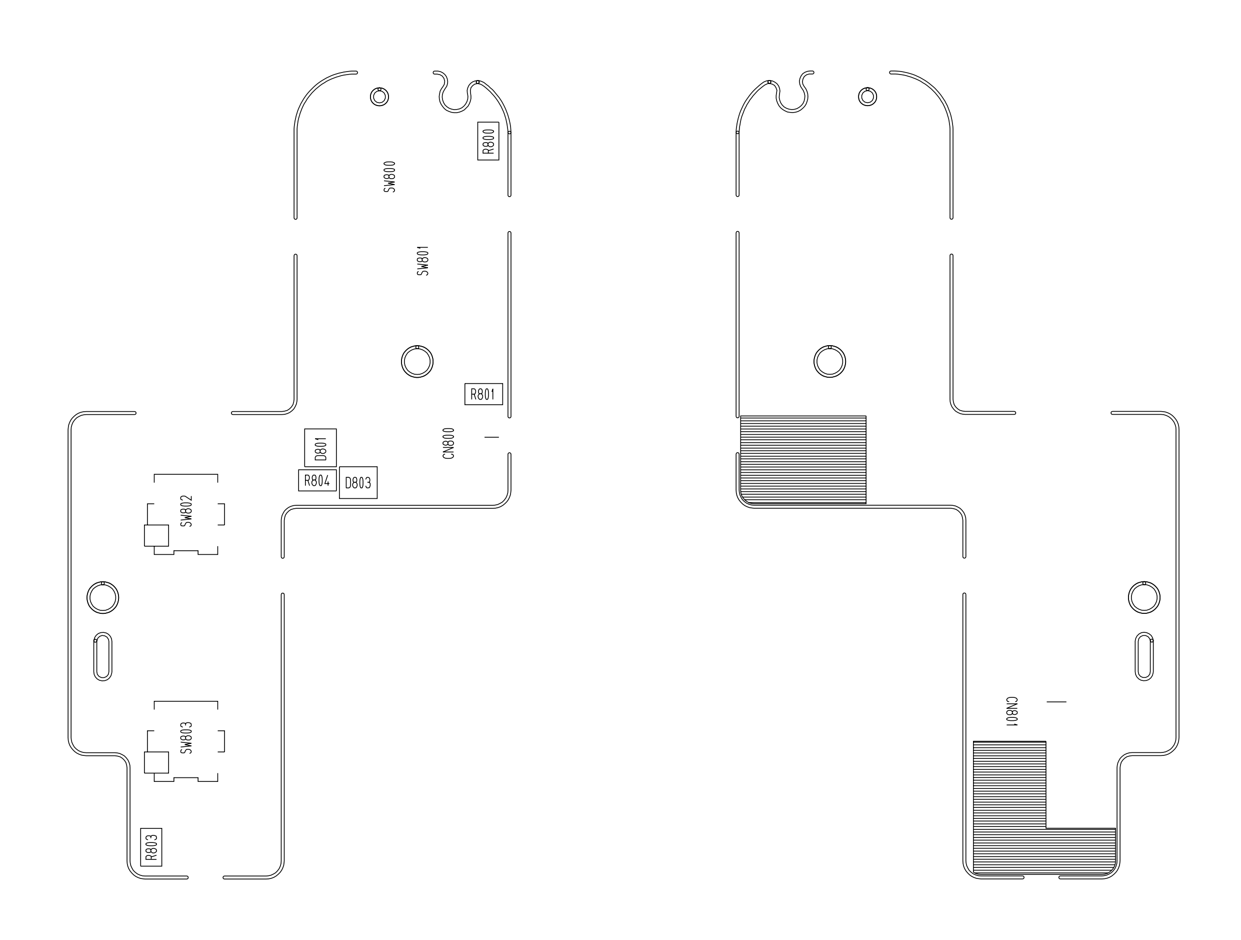
POWER-PCB (PCB-716D-PW)



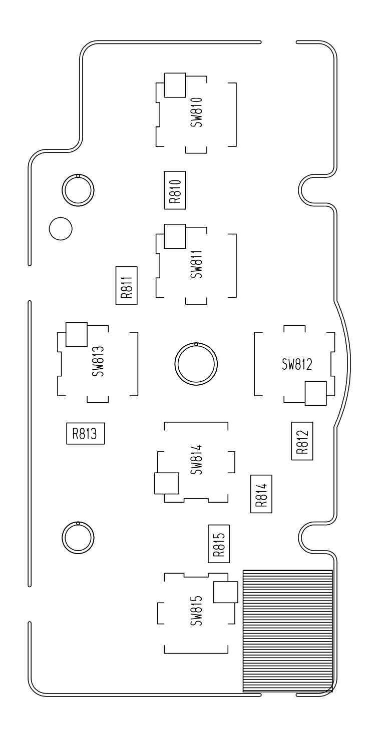
BACK LIGHT-PCB (PCB-716D-BL)

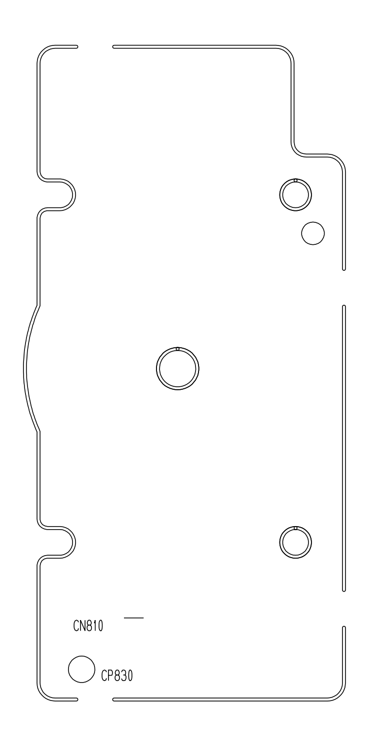


KEY-A-PCB (PCB-716D-KA)

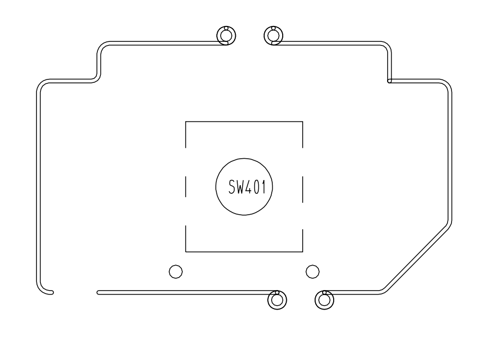


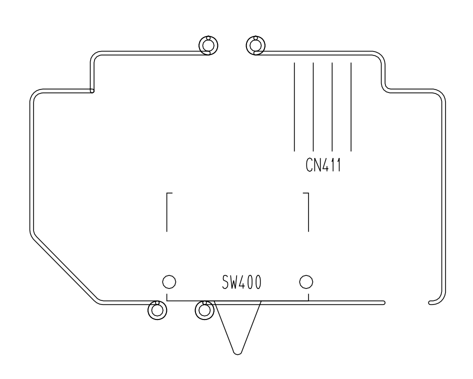
KEY-B-PCB (PCB-716D-KB)



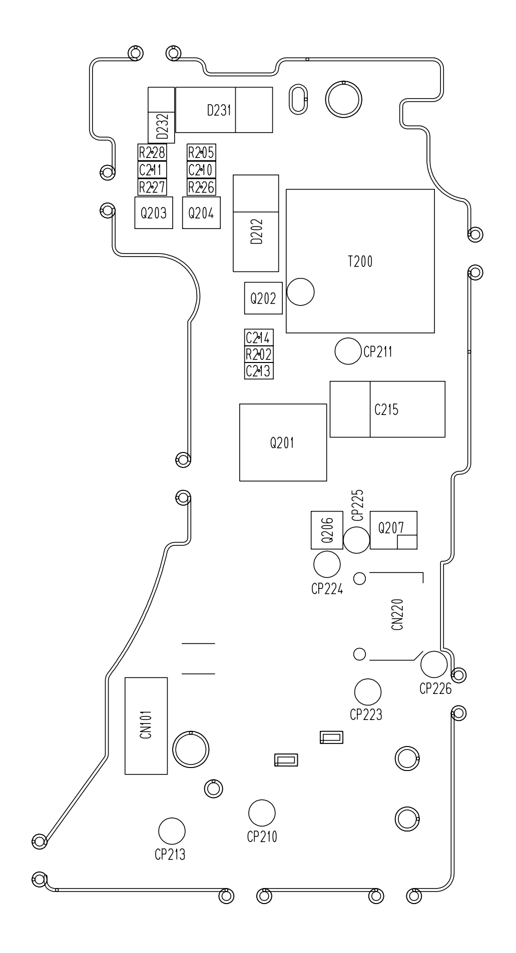


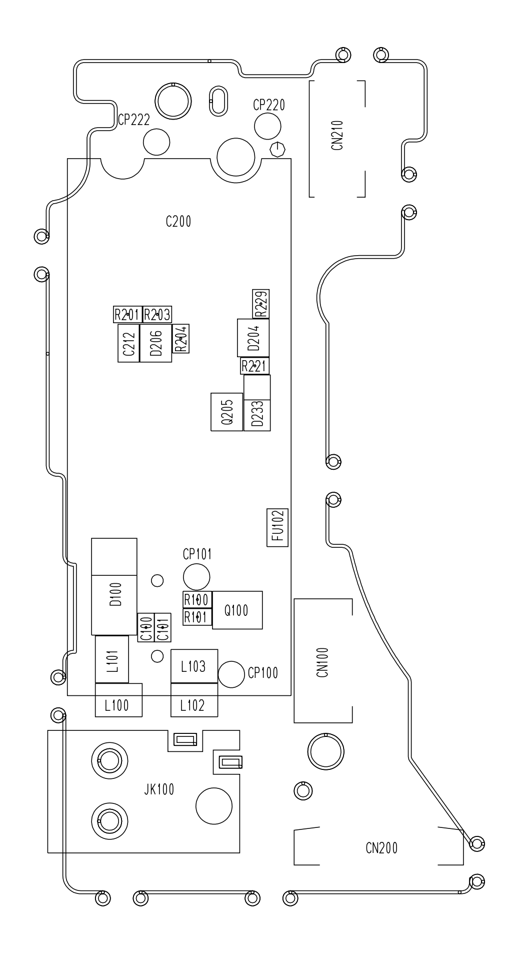
SWITCH-PCB (PCB-716D-SW)



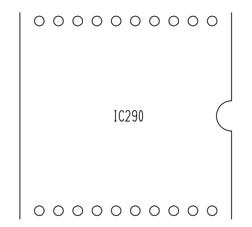


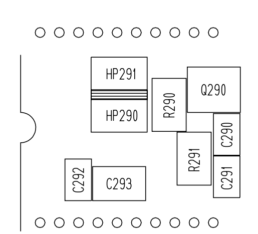
FLASH-JACK-PCB (PCB-716D-SJ)



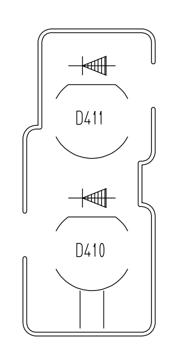


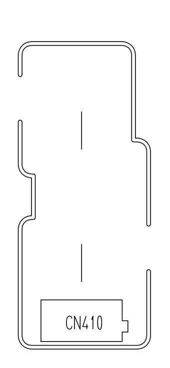
CCD-PCB (PCB-716D-CCD)





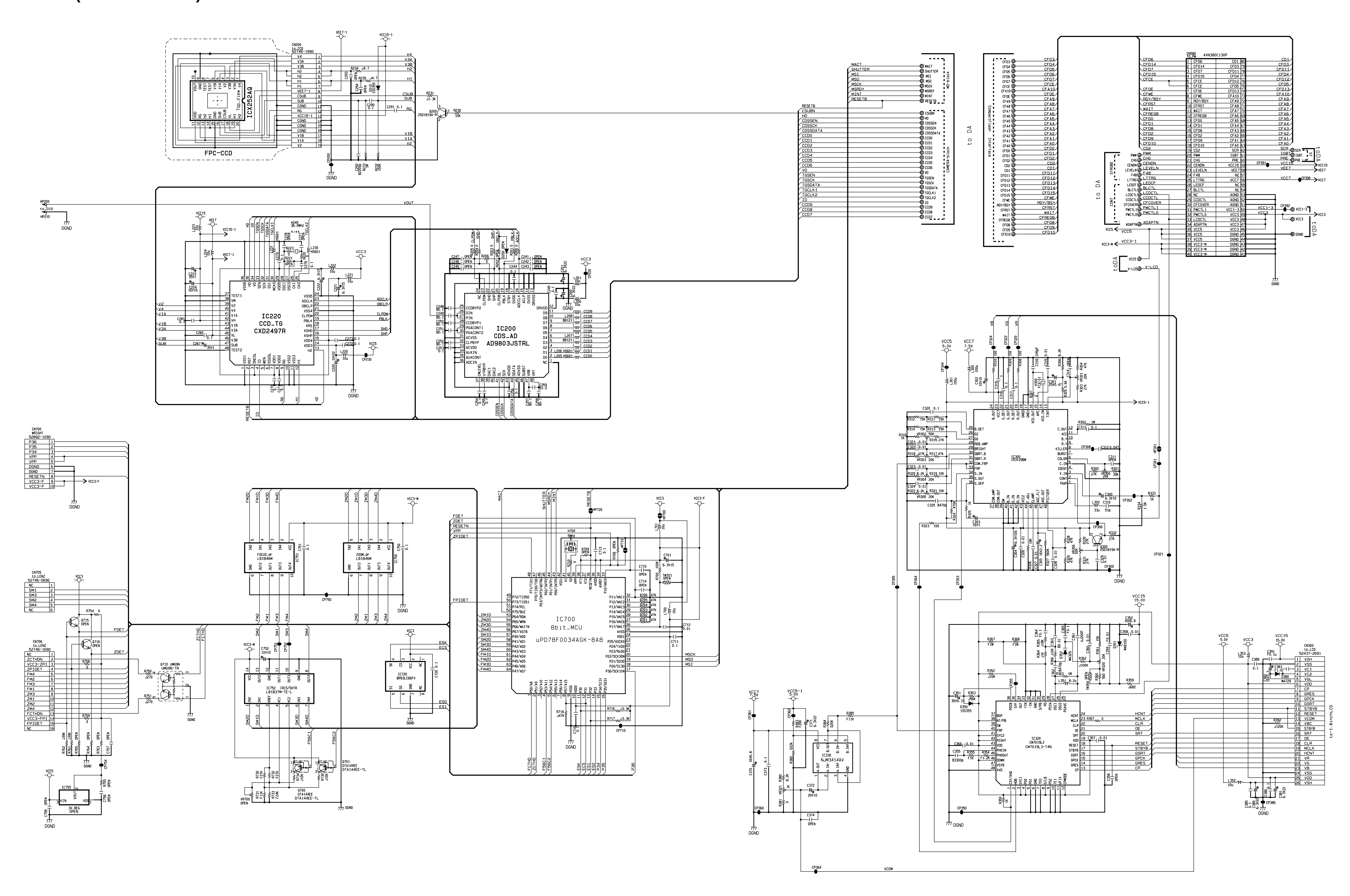
LED-PCB (PCB-716D-LED)



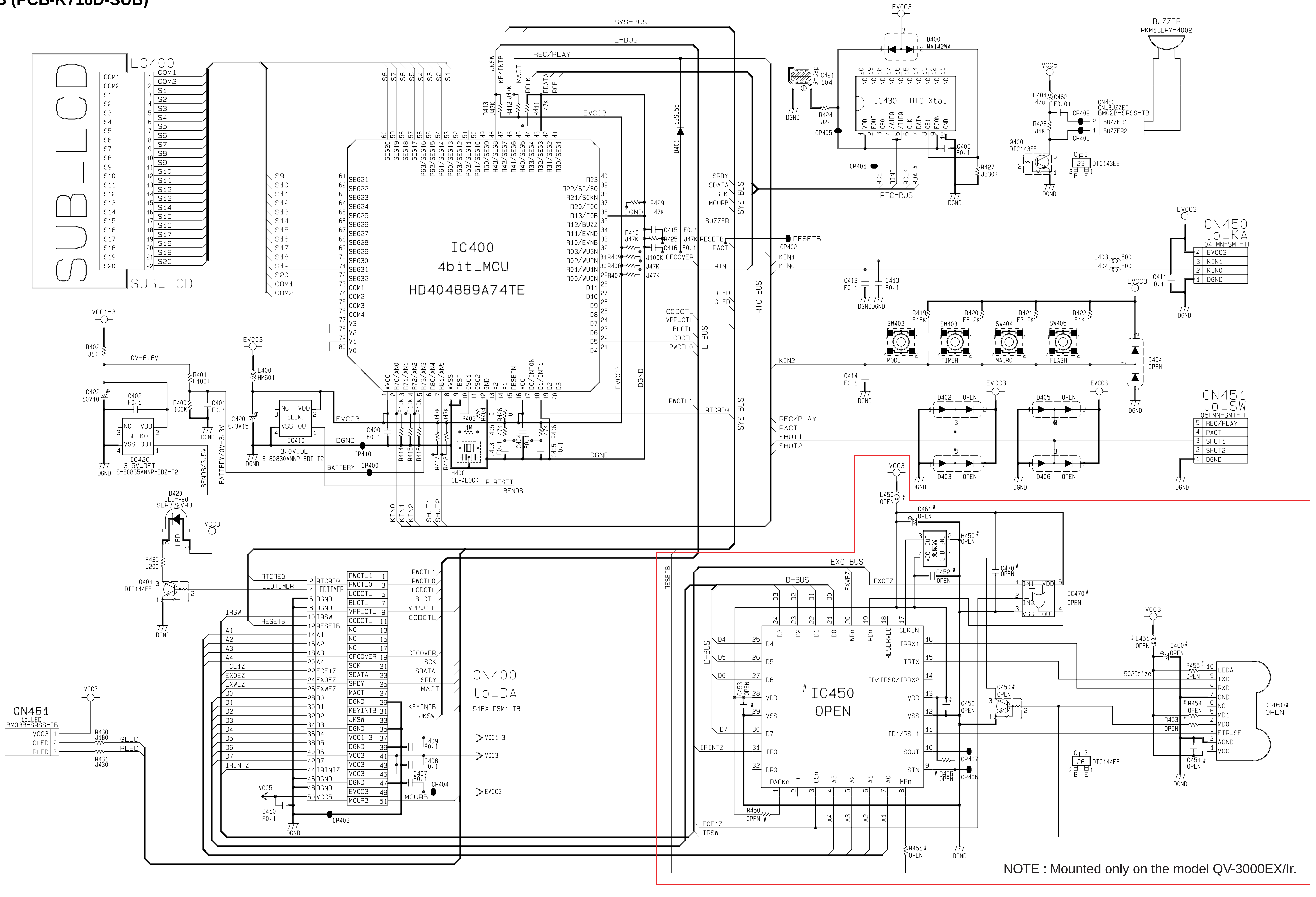


DIGITAL-PCB (PCB-K716D-DA)

DIGITAL-PCB (PCB-K716D-DB)

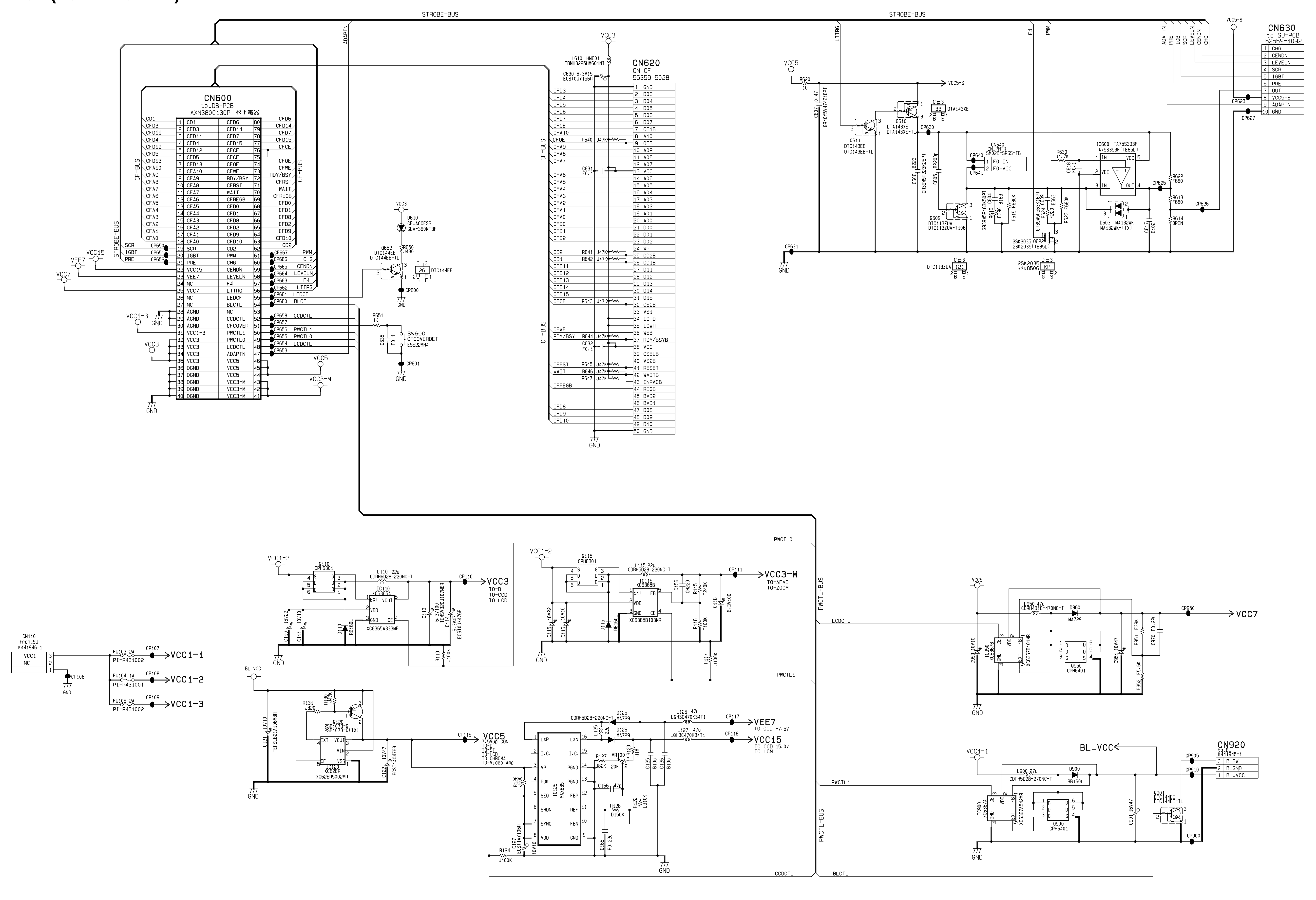


SUB-PCB (PCB-K716D-SUB)

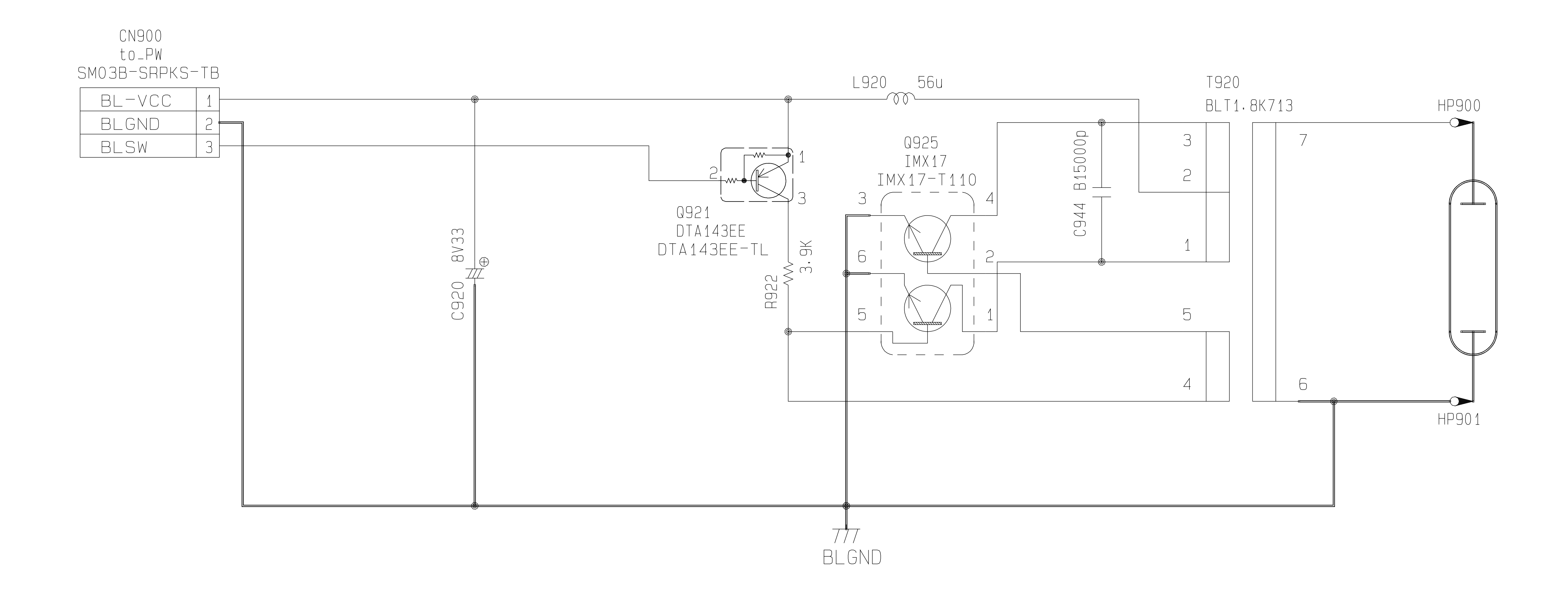


NOTE : Mounted only on the model QV-3000EX/Ir.

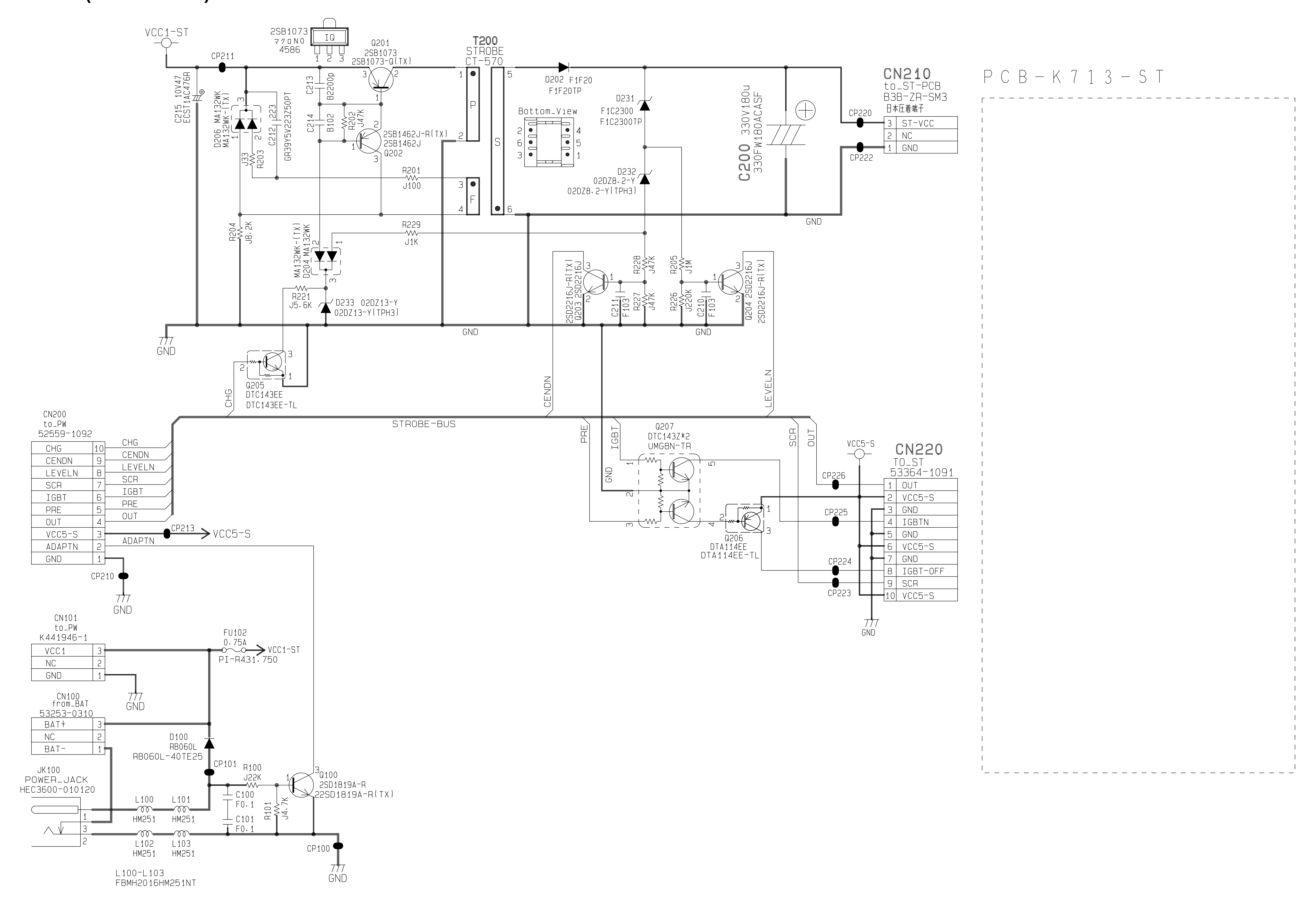
POWER-PCB (PCB-K716D-PW)



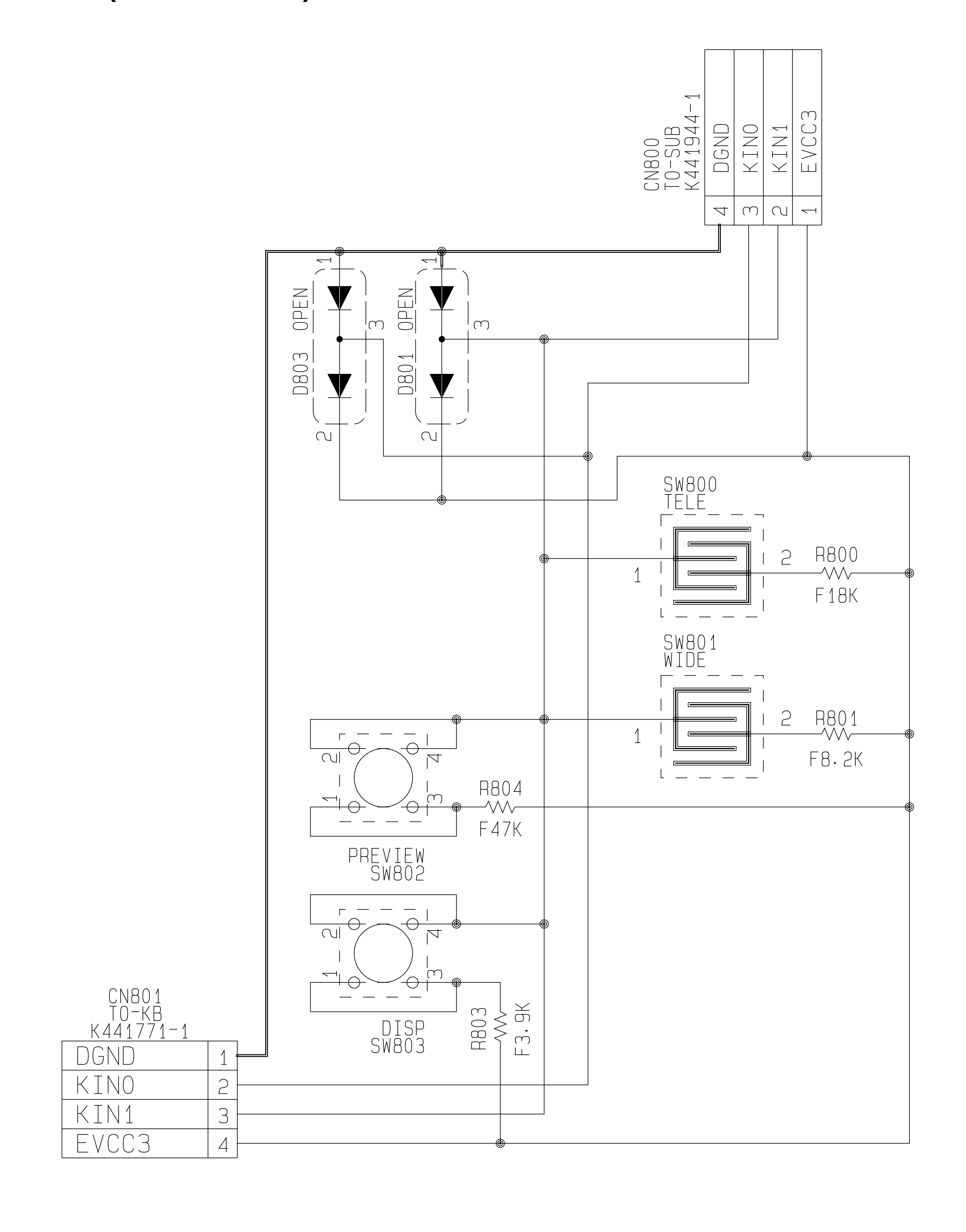
BACK LIGHT-PCB (PCB-K716D-BL)



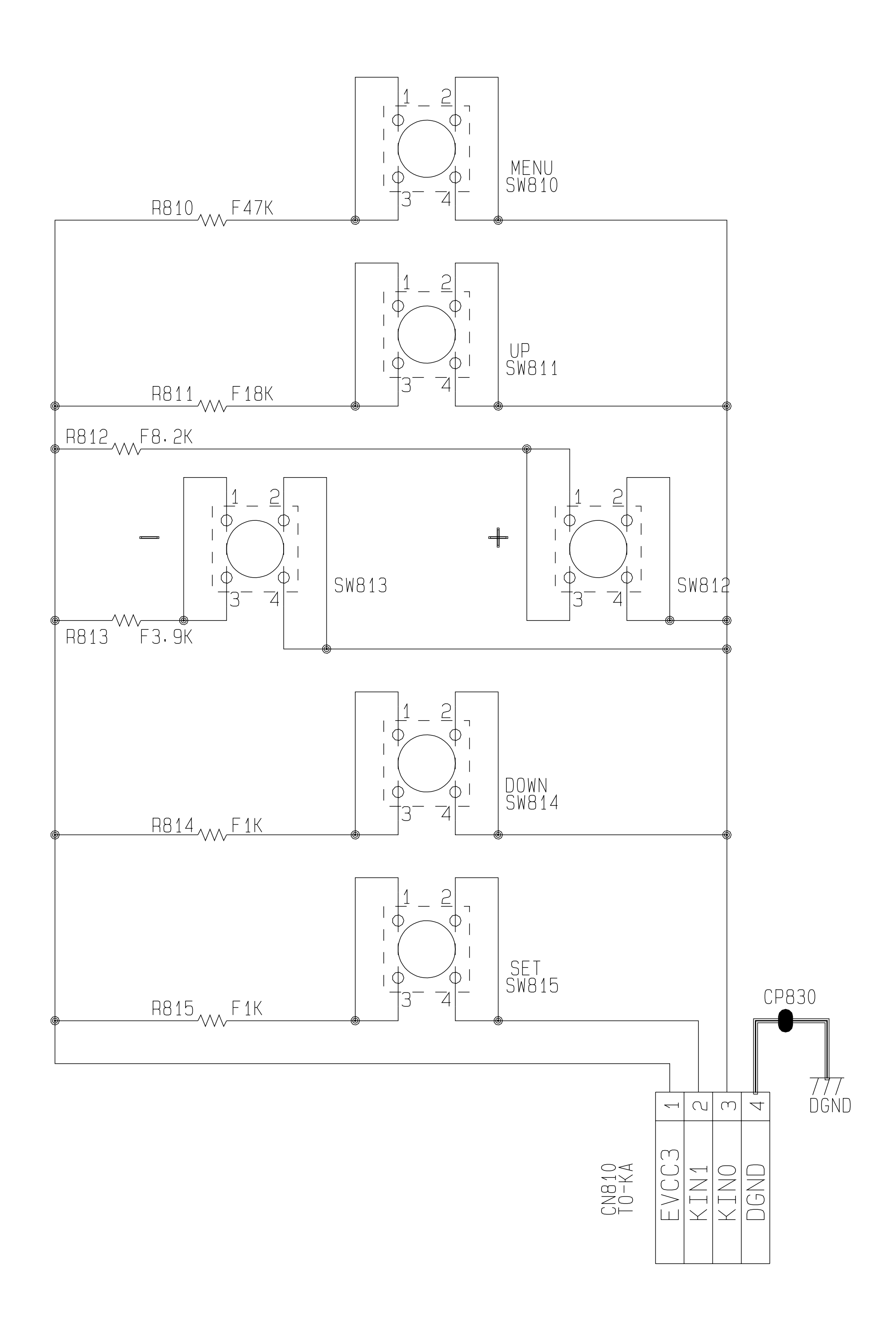
FLASH-JACK-PCB (PCB-K716D-SJ)



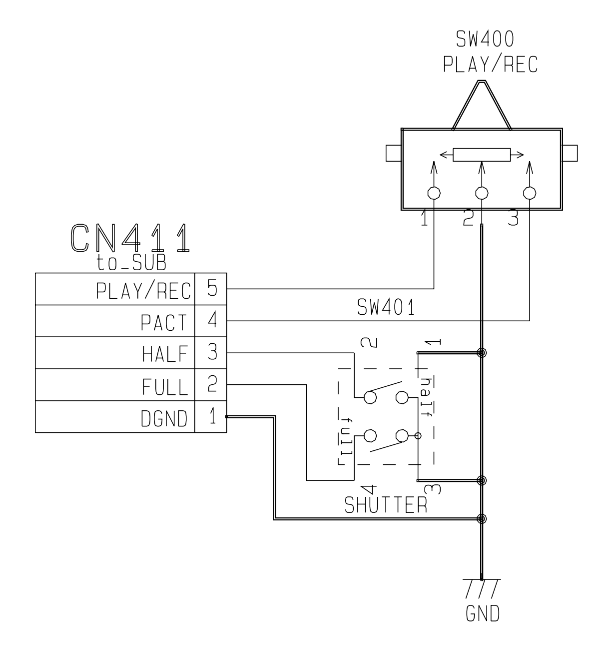
KEY-A-PCB (PCB-K716D-KA)



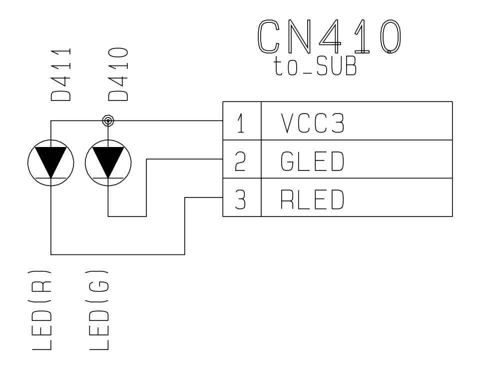
KEY-B-PCB (PCB-K716D-KB)



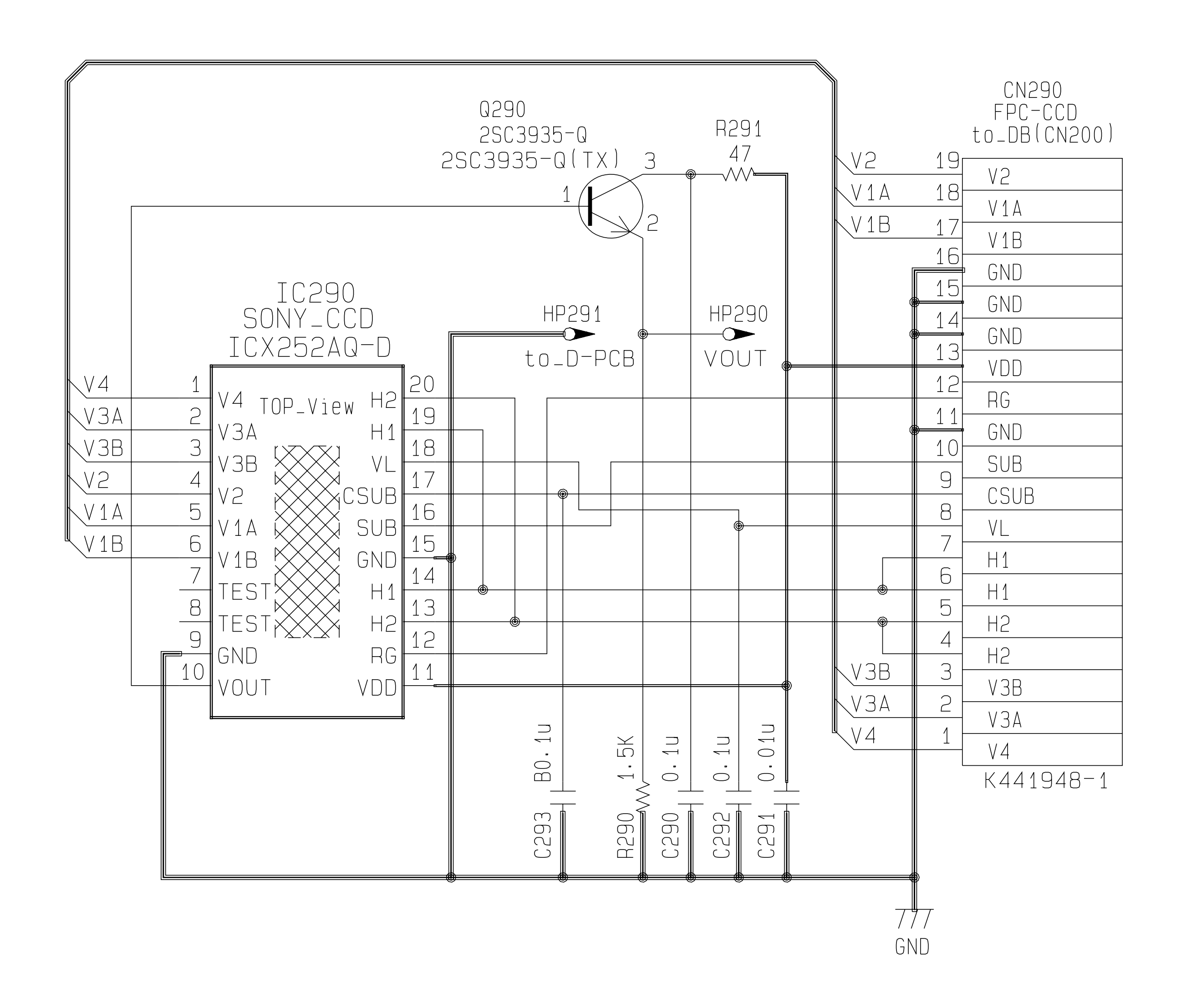
SWITCH-PCB (PCB-K716D-SW)



LED-PCB (PCB-K716D-LED)



CCD-PCB (PCB-K716D-CCD)



Ver. 1 : Change of Page 48.

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